THE CALL OF THE BIRDS

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EXPLORING ENGLAND

THE CALL OF THE BIRDS

By

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"SQUIRREL"

With Illustrations by C. F. TUNNICLIFFE

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The Black-headed Gull

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Dedicated to my Brothers
LEWIS F. BAYNE and DR. ARTHUR M. BAYNE
in grateful acknowledgment of help
and encouragement, without which
this book could not have been com-
pleted, and to my friends at the
London Natural History Society
in memory of many happy occasions

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CHAPTER ONE

FIRST SIGNS OF SPRING

It is delightful to go out on a mild March morning and walk along the country lanes. The herbage is wet but is sparkling with a million gems as the still clinging drops from the last raincloud catch the rays of the cheerful sun. The air is sweet to breathe and everything is touched with the spirit of spring. The buds are swelling and tingeing the hedgerows with red and the elm-tops with purple, the hazel tassels are waving in the soft, genial breeze, the sallow catkins are bursting into silver and gold, the bees are beginning to hum and the butterflies to display their gorgeous wings, and the trees, hedges and fields are ringing with the songs and calls of joyful birds. Such days are not uncommon earlier in the year. Most of us, without referring to diaries, can remember seasons in which primroses were

found blooming in January, hawthorns were clothed with green leaves in February and blackbirds' nests were completed and contained eggs in the one month or the other. These we recall because memory's most blessed quality is that it retains bright and vivid images of joys and pleasures and but poor, dim and faded records of pain and sorrow. Diaries would show us that those springlike days were followed by a sharp return of winter, when the leaves and flowers were shrivelled up by frost and the birds soon began to starve.

Spring may make several false starts in those early weeks and they nearly always bring bitter experience to the wild creatures of the countryside. Our tendency is to wonder at the primroses and to condemn the blackbirds as fools. I prefer to find in their misfortunes evidence of individuality. When we have read the lives of the birds written by biographers who have labelled them and packed them away in neat bundles like the produce of modern machinery, it is a relief to go out and discover that not all of them begin their new adventure at the proper date, but that some have ways of their own and are more ready to respond to the call of spring than others. They may not be the wisest of their species, for, alas! their budding hopes of love and happiness are caught and killed by winter's icy fingers. But surely this failing—if it be a failing—this eagerness to enjoy the fullness of life, brings them and their kind a little nearer to ourselves and makes them more lovable than before.

Some birds are habitual optimists and, though they postpone their nesting operations to a more suitable season, they sing heartily in the dreariest months of the year, to our infinite pleasure and gain. After Christmas only the most inclement weather will keep the thrushes altogether

silent. Some of them sing almost every day from October onwards, but they are young and are not able to achieve the full song. Older birds that sang all last summer begin practising again during January. In February they are nearly perfect and the younger birds are imitating and vying with them.

When we speak of the thrush we mean the song thrush. The missel thrush is nearly as common, but not nearly so well known. Though he is a larger bird, he resembles the song thrush in appearance and is often mistaken for it by beginners even at close quarters, for both are light brown and have boldly speckled breasts. On the ground he may be distinguished from the song thrush by the lighter and greyer tone of his plumage; on the wing, by the white feather on each side of his tail and by his undulating progress; and while perched, by his chattering call and by his more mellow and less varied song.

The best time to learn the notes of these two birds is in January and the early part of February. A little later it will not be so easy, for then there will be the blackbird's song to confuse you.

The song thrush sings in short phrases. Browning's description of his performance is not quite accurate:

> "That's the wise thrush,
> He sings each song twice over
> Lest you should think he never could recapture
> The first, fine, careless rapture."

Really he repeats each phrase several times. The number varies, but twice is exceptional. Other poets have written charming verses in imitation of the song, and the bird is so common that his notes must be familiar to every one.

But not every one who knows them is able to name the singer. I am frequently asked by friends such questions as, "What is the bird that keeps on saying 'Mrs. Bluitt'?" or, "Can you tell me the name of the bird that wakes me every morning by constantly shouting 'How do you?' He annoys me, because I always want to correct him by adding 'do.'"

For the benefit of all such inquirers, and in order to demonstrate a striking difference between two birds which are so remarkably alike in plumage, I venture to give a simple rendering of the song thrush's song. It goes like this:

I *see* you, I *see* you, I *see* you, I *see* you. (pause)
I do, I do, I do. (pause)
Will you do it, will you do it (pause)
Too, too, too, too, too. (pause)
For me, for me, for me. (pause)
Don't say no, *don't* say no, *don't* say no. (pause)

There is no regular sequence in the phrases. Next time "I see you" may be followed by "for me" and "don't say no" by "too," and there are many others that may be interpolated at the singer's pleasure.

Instead of having a number of short phrases, the missel thrush has one which he repeats again and again with slight variations now and then. It is rather longer than the song thrush's longest and is sung legato instead of staccato. It sounds like "I-love-rural-dew." The notes are deeper, softer and mellower than those of the song thrush and that is why they are often confused with the blackbird's song. Many people say they have heard the blackbird early in February when really it was the missel thrush.

When I was studying the missel thrush's song I could not help recalling the old refrain "tooral-i-ooral, tooral-i-ooral, tooral-i-ooral-i-aye." I should not be surprised if I were told that that was suggested by the notes of the missel thrush, for I have heard this bird singing *tooral-i-ooral* over and over again with a short pause after each repetition, and with occasional variations, some of which for all the world were just *tooral-i-ooral-i-aye.*

The blackbird may sometimes be heard early in February or even in January, but usually he waits till nearly the end of February before he tries his voice. He is so conspicuous a bird and so distinctly coloured that, while he is in view, there is no possibility of confusing his song with that of any other. When he is at a distance, a certain similarity between his low notes and those of the missel thrush is puzzling to beginners. The blackbird's are the fuller and richer and they are uttered deliberately, as if the singer were lingering fondly over each before passing on to the next; but though the song begins so beautifully it frequently ends in a series of high, shrill, unmusical notes. By this it may be known when there is any doubt about the main theme. The connoisseur never troubles about it, and with a little experience any one who has a good ear ought to be able to judge by the quality of the tones and the character of the phrasing. When he is in full song a blackbird will sometimes improvise a phrase that might have been taken from a human composition.

I have often felt that there is a sad strain in the blackbird's song like the sadness in the ringing of bells. It seems to be more in keeping with the solemnity of eventide than the lively sallies of the song thrush or the wilder phrases of the missel thrush. On the other hand, the song thrush is supreme at dawn, when the light is momentarily

increasing, the morning air is sharp and challenging and all living things are fresh and vigorous.

The robin, the wren, and the hedge sparrow also sing in early spring. The robin's song is as indescribable as the blackbird's and it is one of the most varied of all bird songs, but it may be heard at its very best in October when it has no competitors. Besides, the robin requires no introduction. Neither does the wren. His tiny brown figure with its perky, upturned tail is easily recognised. But few beginners are able to associate with his tininess the loud, resounding notes of his calls and song. The startling alarm note is usually compared to the winding up of a grandfather clock. The song is worthy of a prize canary and is no doubt some compensation for his diminutive size. It has a beautiful and elaborate trill right in the middle of it and sounds like—

Who-can-SIT-here-and-SING-here-and-tr-r-r-r-r-r-rillllll-
it-as-I-do-as-I-do-as-I-do-I-sit-sit-sit-and-SING-SING
SING-and-tr-r-r-r-r-r-rillllll-it.

The second trill is omitted more often than not.

The hedge sparrow is much more modest, and consequently, though he is a larger bird, he is often overlooked. He has a surprisingly loud and harsh call which may be rendered as *jeep*, but his song is a feeble yet sweet little pipe. To me it suggests

Tootle-LEE-tootle-loo-tootle-loo-tootle-LEE-too.

When he is feeling specially joyful he repeats it over and over again without a pause, and at such times it is not unlike the song of the skylark, though, of course, not

nearly so powerful. In February this pretty refrain is a feature of the hedgerow, but it is such a thin pipe that later, when all the other birds are singing, it is almost drowned in the chorus, or at any rate suffers by comparison with the songs of more accomplished performers.

The most characteristic notes of early spring, however, are the calls and songs of the tits. These engaging little acrobats spend the winter in mixed flocks. Some come to the suet and cocoanuts which are hung up in gardens, but in ordinary circumstances they make most of their living by hunting among the branches and twigs of trees. They search in the crannies of the bark for larvæ or pupæ of insects or for spiders' eggs, or they dig their way into a rotten branch for insect eggs that have been hidden deep in its soft fibres, or they carry the quest to the very tips of the tiniest twigs, performing acrobatic feats there to make quite sure that no possible prey shall escape them. At such times they are at their very best, and are an endless source of interest and delight to any one who cares to watch them.

You will recognise the blue tit by the fact that he has a blue cap. I know one part of the country where he is called the blue bonnet. His wings and tail are also blue. The great tit is the largest of the family, and is a very handsome bird. He has a velvet-black head and white cheeks, and a black band running down the middle of a bright yellow breast. The cole tit is much more modestly attired. He has a black head and a grey back, but in spite of his name, the mark by which he is most readily distinguished is a large white patch on the back of the head. It is important to remember this, because another species, the marsh tit, which is also common, may be confused with him. In size and general appearance the two are very much alike, but the marsh tit's head has no white on the back

and the general colouring of its body is brownish. I use the old spelling of "cole" because the original meaning of the word was not black combustible matter, as we understand it to-day, but a flame or blaze, and this suggests that the name refers to the white patch.

The tits are a most interesting and at first a puzzling group, but as you watch them you will gradually pick up their various calls, and before long you will be able to associate each with the species to which it belongs.

The cole tit has a tiny voice, yet you cannot help feeling as you listen to his song, which consists of two notes repeated many times, that it has a very pleasing ring. But if you watch him closely you will notice something more about it. It is not always exactly the same.

I remember one spring day stopping to listen to a cole tit that was hopping about alone on the top of a wall. His movements were strangely slow and quiet, and he was calling in a soft, plaintive way—*me—too*, repeating it frequently, but each time after a long pause. The first syllable was not quite "me": it was a sound between "moo" and "me," and this seemed to give it a touch of sadness and tenderness which at first I could not understand. But presently something flashed on to a tree on the opposite side of the road, and in a moment my cole tit flashed after it, and everything was changed. Instead of moving slowly and calling sadly, he was now darting about quickly from twig to twig with his mate, not always flying, but often just flinging himself from one spray to another in sheer delight, and singing joyously and continuously and at the full pitch of his voice, *we-two-we-two-we-two-we-two*. There was no time now for pauses in his song, for his tiny heart was bubbling over with happiness.

Besides his song the cole tit has a call that sounds like

fee-choo, and this may be followed by a curious sizzling. The whole call might be rendered thus, *fee-choo-zi-z-z-z-z-z-zig*. The marsh tit has a similar song and call, but they are much louder than the cole tit's and have a harder, somewhat metallic ring. The song sounds like *we-chum-we-chum-we-chum*, and the call like *pse-chum-za-za-za-za-za*. He has also a special song of his own, which consists of one note repeated six times thus, *chum*-chum-*chum*-chum-*chum*-chum. To this the singer sometimes adds four or five warbling notes. This little warble, which is unique among the tits, is occasionally uttered alone.

The reference books usually describe the spring call of the great tit as "teacher," and it is quite common to hear naturalists speaking of it as the "saw note" or the "saw-sharpening note." Now, who would ever dream of going out to welcome spring by listening to a man sharpening a saw? Most of us would rather go to the dentist's. As a matter of fact the spring song of the great tit is one of the most joyful sounds in nature. Even the "teacher" of the books does not describe it satisfactorily. Indeed, that word is actually misleading, because, though the bird does sometimes sing "teacher," its full song consists of three notes. To me it sounds like *b-but-see* repeated again and again with the accent on the *but*, in much louder and more resounding tones than the *we-two* of the cole tit or the *we-chum* of the marsh tit. But often the bird changes the accent so that the song becomes *see-b-but* with the accent on the *see*, or if you like, *tea-ch-cher*. Sometimes he omits the middle syllable, and then the refrain may be *tl-ee-tl-ee-tl-ee-tl-ee* with no suggestion of *ch* in it. This song is one of the most familiar and most welcome country sounds in early spring, it is so loud, so ringing and so full of joy.

The great tit's usual call is a clear, sharp, *ping-ping-zhee-*

zh-zh-zh-zhee. His *ping-ping*, which he often shouts separately, is very like, and may quite easily be mistaken for, the *pink-pink* of the chaffinch. Perhaps it was originally an imitation, or rather an assimilation; for the whole phrase is obviously a modified version of the related calls of cole and marsh tit. He has also a number of other notes which at first are confusing. Some of them may be uttered on the spur of the moment by individuals, but there are several that seem to belong to the species. An interesting one is *hoyee-hoyee*, which has a query in it and is not unlike our coo-ee. Another is *pee-hoy*, *pee-hoy-hoy-pee*, or *pee-choy-tee*, another *pee-t-t-t-t-tit*, and still another *tit-so-o*, which suggests very vividly a child reiterating "'tis so" while on the point of weeping. Indeed, if he were to string all his common calls together he could make a song as elaborate as that of the thrush.

The long-tailed tit has at least three calls, *check*, *shirrip*, and *sree-sree-sree-sree-sree-sree*. In spring the last becomes richer and more expressive in tone, and my impression is that it is used as a song.

The most charming song of the whole family is the blue tit's. Like his cousins, he sings it most persistently while he is hard at work, swinging perilously at the tip of the outermost twig, or circling the stouter branches, and eagerly searching every bud scale and every roughness of the bark for possible prey. Without pausing in his task, he sends a ringing message to his mate to *take-tea-t-t-t-t-t-too*, but often he insists upon it thus, *take-tea-teea-t-t-t-t-t-too*, repeating the *tea* on a higher and shriller note and with all the emphasis he can summon from his marvellously forceful little being. He has several other variations which he employs at will; one of them is *take-tea-t-t-t-too-take-tea*. His call is a cheerful *cherr-r-r-r-r-ry-chick-chick-chick*.

In March a little bird, which is tit-like in character and is closely associated with the tits during the winter, begins to sing, but his song is so tiny that it is never noticeable. Very few know it at all, and many of those who have heard it have mistaken it for something else. I, for one, wondered for long whether it was the song of a bird or of an insect, or the squeaking of a bat or a mouse. If you happen to live near a patch of pine trees you are almost certain to hear it on a mild March day. The song is in two parts, which are quite distinct though there is no pause between them. No doubt you have often heard the first part, *iffyhee-iffyhee-iffyhee*, which is so slight and so shrill that it suggests the sibilant whisper of two dry grass stalks rubbed together by the sea wind on a sand dune, but you have passed on without noticing it or have treated it as one of Nature's insoluble mysteries. If, the next time you hear it, you pause and listen, you may catch the second part, which is a tiny warble. It is so tiny that it is difficult to follow, so you may have to listen many times before you are sure of all its notes. The whole song goes like,

Iffyhee-iffyhee-iffyhee-chee-chee-chee-cheerily-wee,

and it is sung so rapidly that it is finished almost before you are aware that it is well begun. The singer is the golden-crested wren, the smallest British bird. He is so small and so modestly plumed except for his brilliant crest, which is seldom seen save when he is clinging upside down to a twig, and he flits about among the branches so restlessly, that he is almost as difficult to see as his voice is to hear.

I can understand that the goldcrest's song may be too high in pitch to be caught by some ears, but the statement

in most reference books that the tree-creeper's is likewise beyond the reach of the same ears, is misleading. Several of my friends whose knowledge of birds is much superior to my own, have never heard the tree-creeper sing and they are living under the belief that their own hearing is at fault. Another made his first acquaintance with the song after forty years' devoted study of birds, and then to begin with the bird was some thirty yards away and his voice was blanketed by the branches and foliage of many trees. Those who are fortunate enough to have a pair of tree-creepers nesting in their immediate neighbourhood are quite familiar with the song. I have heard it myself only in April and May, but Mr. Coward has records of it in every month except September and October. When the bird does sing, he sings continuously and his notes are as full and clear as those of the willow warbler. Viscount Grey says that they remind him of the goldcrest's song, Mr. Coward represents them as *see-see-see-sissy-pee*, and Miss Turner, who likens the song to that of the hedge sparrow and describes it as "weak, complaining and plaintive," renders it as *ticka-tee-tee-tee-tee-tee-ticka-ticka*. I find it difficult to believe that these interpretations can refer to the same thing, and impossible to reconcile them with what I have myself experienced. I have heard the tree-creeper sing two songs, each quite definite in form and differing from the other as distinctly as a tune by Mozart differs from a tune by Elgar. Each was sung by a separate bird, and was duplicated so frequently that I was able to carry away a lasting impression of it. I could not describe either as complaining or plaintive; both were jolly, confident and assertive. Neither suggested the goldcrest's song. One which in quality of tone might be compared with the hedge sparrow's voice, though I would myself prefer to compare it with the willow war-

bler's, consisted of a single phrase which was sung legato, rose to a high note three-fourths of the way through and then dropped quickly to a good finish. The other was staccato and was made up of three distinct trilling phrases which may be rendered thus:

Te-te-trrree, te-te-trrree, te-te-trree-trree-trree-trree-trree.

All I need add to make that a perfect representation of it, is that the first eight syllables were sung on the same high note and the last five descended chromatically. Of both I would say that, from the point of view of musical construction, they are among the most perfect of our bird songs. One was sung in Essex, the other in Kent. Is it possible that this bird, which lives in isolated pairs and can seldom have the opportunity of hearing the notes of its nearest neighbours, sings a different song in different parts of the country ?

The chaffinch and the yellowhammer may be heard occasionally in February, but they do not attain their full voices until March. Then their songs become a feature of the countryside, and as both birds are easily recognised, the chaffinch by his rosy breast and white wing bars and the yellowhammer by his lemon-coloured head, the notes are soon familiar to the most casual observer. There is a certain similarity in the form of the two songs, and I have often thought that the performers were repeating the same theme, the chaffinch in the major and the yellowhammer in the minor key. The chaffinch is the supreme optimist, and his rattling, joyful song, which he delivers with a pardonable swagger considering the brilliance of his new spring clothes, goes like,

What-what-what-what-d'you-r-r-r-r-really-think-of-ME-now.

The yellowhammer is the doleful pessimist and he sings plaintively,

What-what,-what-what,-d'you-think'll,-happen,-t'-ME-please.

The very old and very popular "A little bit of bread and no cheese" hardly describes the song, for though the notes are uttered very rapidly, they are grouped in pairs, the accent being on the odd syllables, first, third, fifth, and so on. In both songs the second last note is high and the last is low.

Later in March another distinctive note breaks out and gradually becomes a dominant part of the general chorus. This is the call of the greenfinch. It is a harsh note which sounds like "breeze," or more correctly, as it seems to me, *zhweerrz*. Even this is only approximate, for though it includes the letters z, w, and r, the bird is able to pronounce all three together. The word "breeze," however, is easily remembered and conveys quite a good suggestion of the sound. The greenfinch has a habit of repeating this call by the hour; it seems to serve as his challenge.

The chaffinch has a similar call which he repeats in a similar way. This is a puzzling note to beginners. I myself was deceived by it for several seasons, but after I had spent a spring in a district where the greenfinch is common, my ear became so familiar with his call that I have now no difficulty with the two. His is a longer, more sustained note than the other, and though it is harsh, it has feeling in it, whereas the chaffinch's suggests a showman's wooden clapper. The greenfinch proclaims himself from the topmost twig of a tree, or from some high and prominent perch, but the chaffinch calls from anywhere among the branches and moves about restlessly from point to point. This note of the chaffinch may be some relic of a closer

relationship between the two species, or it may be the result of imitation, or the similarity of the two may be a coincidence. Considering the persistence with which the greenfinch repeats his, it would not be surprising if he were imitated, and perhaps it is a proof of the good taste of other songsters that the only suggestion of such flattery comes from one of his own kith and kin. But whatever the explanation may be, the greenfinch's song is quite unlike the chaffinch's. It consists of two or three notes each uttered separately and repeated many times, thus,

Trit-t-t-t-t-t-tit
Trot-t-t-t-t-t-tot
Chum-chum-chum-chum-chum.

There is a pause after each phrase, and the "breeze" call is often introduced either for variety, or more probably as a reminder, to all whom it may concern, that the singer is the same bold spirit as challenges regularly from that particular tree.

Another attractive spring note in the southern half of England is the call of the nuthatch. At all seasons this bird employs a clear *whit-whit* in talking to his mate or companions, but in spring he becomes more lyrical. Then he shouts *pwee-ah*, *pwee-ah* in loud but pleasing tones. While this is still unfamiliar you may mistake it for the singing of the thrush. He has another spring note which is also confusing at first. It is *pwee-pwee*, *pwee-pwee*, *pwee-pwee*. This is so like the call of the lesser spotted woodpecker that unless you know both well, you cannot be sure which of them you are hearing until you have seen and identified the bird. Both are handsome, but they are quite distinct in form and plumage. The nuthatch is blue-grey above and

rich chestnut-buff underneath, and he has a bold black stripe through his eye. The lesser spotted woodpecker is black with a number of large white splashes on his back and a brilliant crimson crown. When he is in flight, his large head and short tail give him the appearance of a dart. In shape the nuthatch is a normal perching bird.

The woodpeckers have a remarkable call of their own which is used most frequently in spring and especially during courtship. Being tappers by nature, they have discovered that a resounding note can be produced by striking certain parts of a tree with the bill in a rapid succession of blows. It sounds like,

r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r

Pause

r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r-r

and may be repeated thus for some time, and, as one bird answers another, it may go on with intervals for a whole morning.

Both the lesser spotted and the greater spotted woodpecker use this call commonly, and I am positive that I have also heard the green woodpecker drumming. The green woodpecker's well-known vociferous yaffle,

Yah-yah-yah-yah-yah-yah-yah-yah-yah

sung on a descending scale, is so loud and arresting that he would seem to have no need for drumming. Most reference books give the impression that he never drums, but enough evidence exists to confirm my belief. Apart from his drumming, the greater spotted woodpecker has only a single note, *geck*; the lesser spotted has a loud well-defined call of one clear note repeated several times.

At the beginning of March the rooks finally settle down in their rookeries to which they have paid frequent visits during the latter part of February. It may seem strange to speak of the rook as a songster, but it is always pleasing to listen to the cawing of a rookery, and in March when this is full of the happiness of spring and next building, it becomes a kind of joyful chorus.

Later the lapwings, which some weeks earlier returned to the fields but continued to live in closely packed flocks, take possession of their nesting territories and scatter. They still live in company but spread out in open formation, each pair occupying its own particular portion of field and meadow. At once they are transformed. Yesterday and for months past their broad, dark wings and their slow, heavy flight gave them a mournful appearance. But now what a difference there is! When they are on the wing, calling joyously as they rise and swing, rush, plunge, and swoop through the air, it is difficult to believe they are the same birds. They spend much of their time playing in the air, wheeling and tumbling and calling for the sheer joy of living.

Out on the marshes and moorlands spring is announced by the "drumming" of the snipe and the calls of the curlew and the redshank. The snipe's drumming is different from the woodpecker's both in origin and in effect. It may be mistaken for the bleating of a goat by people who are not familiar with it, and the snipe is therefore sometimes called the mountain goat. For long it was a puzzle to naturalists and was the cause of much controversy. We know now that it is not caused either by vibration of the voice or by the rattling of the bill. When you hear it you should look up and follow the movements of the bird, which you will see circling at high speed above you with rapidly beating

wings. Every now and then he will throw a loop. As he does so he dives, and it is at that moment that you will hear the bleating or drumming. At the same moment, if you are watching him through field-glasses, you will notice that he extends a feather at each side of the tail. These two outermost feathers are much stiffer than the rest, and when he plunges, spreading them out at a sharp angle from his body, their violent vibrations, as they are rushed through the air, create the peculiar note. Any one who happens to possess one of these feathers can demonstrate this for himself by holding the quill between finger and thumb and making a quick downward stroke with the stiff web bearing full against the air. It is thus a purely mechanical sound, yet the bird, by the vigour and verve of his plunging, is able to impart to it a quality which expresses something of his spring ecstasy.

The curlew's note is a true song. It is a long-drawn single note and is often described as wailing, but nevertheless, it is fraught with happiness. Besides its plaintiveness, it has another feature to which it owes much of its beauty and charm. This has been called bubbling by some. A better idea of it is conveyed by the bird's own name. As this is pronounced now in England it is kehlew and it is generally associated with the bird's common call, which is more accurately suggested by the Scotch name whaup, if only you will raise the voice on the "up." Originally the name is supposed to have been derived from two French words, *cour* and *lieu*. As such it would be a clever imitation of the song; for when a Frenchman says *cour* he rolls the r round thoroughly in his throat and this represents as closely as a word can the beginning of the song, while *lieu*, again as pronounced by a Frenchman, suggests the wailing end of it. But even so it is not perfectly onomatopœic until

the r and the l are combined. I am therefore disinclined to accept the etymologists' derivation, because the name could much more simply have been suggested by the ancient word curl, in which the r was pronounced. One obsolete meaning of this word was to purr like a cat, and the curlew's song is a purring whistle.

A third feature of the song is the manner in which it is delivered. The bird mounts thirty or forty feet in the air and then, while gliding gently down, pours out his heart in his long, curling note, which gradually dies away as he slips out of sight among the heather.

I think the curlew's song is one of the most beautiful sounds in nature and I would travel far to hear it. But for sheer, outbursting, passionate spring gladness, I have heard no bird note that could surpass the wild, barbaric love-song of the redshank. It is a wonderful experience in March or April to tramp across the marshes where this bird is common and share in his rejoicings. His ordinary call, *tyu-hu, tyu-hu-hu*, is richly imbued with a haunting melancholy, and even in the abandonment of his spring rhapsody, there is still more than a touch of this beautiful plaintive quality. High above the marsh he hovers, his wings outspread and apparently rigid, yet vibrating rapidly at the tips and thus giving the impression that his whole being is quivering with excitement, and whoops deliriously, repeating over and over again the single note *teu*. That is his mad dance, but when he tires of it and glides down to the marsh, he sings his gladsome song. *Te-léera, te-léera, te-léera*, he shouts. All the wonder and joy of life are in the notes. It is a beautiful, rousing, thrilling cheer. Spring is here.

CHAPTER TWO

OUR SUMMER VISITORS ARRIVE

About the middle of March great events take place. Then the first of our summer migrants arrive. This is not the beginning of the spring migration. Weeks before the appearance of the first summer visitor, the great tide of bird life which ebbed last autumn, starts to flow. If you observe the birds carefully, you will notice that the song thrushes in your neighbourhood increase during February. From upland districts they have been absent for months, but now they will return to their old quarters and rejoice the land with their song again. Though they are counted among our all-the-year-round birds, only a few remain with us during the winter, and those few are to be seen in the lowland districts. The rest leave the country in September and fly to a warmer climate farther south, but

they are among the very first of the oversea birds to come back. So they are really migrants, but because of the few that spend the winter with us, we count the thrush as a resident.

The skylarks, which for months past have lived in flocks, scatter about this time, and many others which have wintered abroad, return to swell the numbers. In the lowlands we have never missed them except for their songs, but they have been away from the upland meadows for five or six months and their reappearance there in February brings tidings of approaching spring. Lapwings also return to the uplands and curlew, redshank, snipe and meadow pipit to the moors.

Guillemots, razorbills and gannets, which depend entirely on deep-sea fishing for their livelihood, remain on the open ocean throughout the winter months, but in February they revisit their nesting quarters on inaccessible cliffs and islands. The gannets will not nest till well on in April and the others not before the end of May, but suitable ledges for their nesting operations are limited, so no doubt they come thus early to secure the best and retain them by use and wont.

While these changes are proceeding, others which are equally important though less obvious are also taking place. Many of our resident birds such as wild duck, starlings, gulls, skylarks, wagtails, robins and finches which have spent winter in flocks in southern or western counties, or in Ireland or the Hebrides, or even on the Continent, move northward and eastward and gradually scatter themselves over the country. In some districts their arrival will be noticed only by very keen observers who may realise that the numbers of certain species have increased in their neighbourhoods. In others they will occupy country from

which they have been absent, or in which they have been rare, for months past.

Some of these flocks will not scatter in this country. They will pass on in close company to the north-east coast and from there in due time will cross the North Sea to Scandinavia, or to the south-east coast from which they will voyage to Holland and thence to Central and Eastern Europe. About the same time flocks of fieldfares, redwings, snow buntings, bramblings, and other species which nest in the far north and pass the winter in the British Isles, set out for their summer quarters in the Arctic Circle.

But that carries us on into April and, as I have said, the first of our summer visitors arrive in the middle of March. Even then the newcomers are modest and retiring and consequently are overlooked by most of us. The swallow and the cuckoo which reach us much later, show and announce themselves boldly and have therefore been hailed as harbingers of spring by the poets and their followers. Lovers of birds who go out to see for themselves what is happening, are more just in their distribution of honours and have the pleasure and satisfaction of welcoming the true harbingers of spring some days before winter actually passes.

If, on the 12th of March, you walk along the more deserted parts of the south coast, you will most probably see, flitting before you, a little bluish grey bird, with black wings and tail and a large white patch on its rump, that is, the part of the back just above the root of the tail. This white patch is the feature that will attract your attention first, for it is conspicuous as the bird rises from a stone at your approach, and flies onward for forty or fifty yards. He is not at all shy, but will sit on his lowly perch, bobbing his head and flicking his tail and watching you intently till

he thinks you are getting too dangerously near, and then he will pass on a few yards farther and stop to examine you again. There is something robin-like both in his actions and in his confidence and curiosity. He is not afraid of you. To him you are a rarity and an unknown quantity, and though you may be quite harmless, he intends to keep out of your reach for the present as a matter of ordinary precaution. I have a feeling that if we were to live on the inhospitable wastes which he has made his own, he would become as friendly as the robin, provided that we did not convert the wastes into hospitable gardens. If you stand still he will remain where he is long enough to let you make a careful study of his plumage.

You will see that in addition to his other striking features he has a light buff breast, and a bold black line passing under the eye from the bill to the ear, and then widening out into a spot. It was formerly supposed that his name, Wheatear, was derived from this black blob which has a fancied resemblance to a grain of wheat, but the word is really white-*ærs*, its second syllable being Anglo-Saxon for posterior, and thus refers to his most conspicuous feature. He is such an attractive and beautiful little bird that one wishes he were a familiar inhabitant of our hedgerows and gardens. But he is to be seen only by those who visit his own special haunts. He may take up his summer quarters on the seashore where you see him, or on neighbouring wastes such as links or marshes, or he may pass on to bare hillsides, gorsy commons or barren moorlands. Wherever he settles down he will find a hole either in the ground or in an old wall, and there he will make his nest. Often he selects a deserted rabbit's burrow for the purpose.

The wheatear is the first of our summer visitors. But there is something more in his arrival than the mere fact

that he is first. I have said that you will see him on the 12th of March. That is like saying that the Atlantic ferry will arrive at Southampton on Saturday, or that the Scottish express will reach Euston at 7.52 a.m. to-morrow. Since last September, when he departed for his winter home, this little bird has crossed the globe twice, and after travelling all those thousands of miles without the aid of compass or sextant or clock or calendar or time-table, has come back to the point from which he started, as if he had been working to a schedule. How he does it is a mystery; we can only marvel at the accomplished fact.

The wheatear is by no means the only bird that is so exact in his coming. Between the middle of March and the end of April it would almost be possible to tell the date by noting the arrivals of the various summer migrants. Each has its own date and as careful records have been kept for many years, it is reasonable to expect that this or that bird will be here on or about a particular day of the month. But when we say that, we must bear in mind that this is only the date of the first individuals of the species to come ashore.

I have said that the wheatear may be seen here on the 12th of March. That does not mean that all our wheatears have arrived. A few of the bolder spirits in small parties have come on in advance, and the moment they alight we can count that species as being once more a British bird. A few days later larger flocks cross the Channel, and they continue to come for several weeks. So though it is true to say that the wheatear is here on the 12th of March, the bird may not reach your own neighbourhood till a week or even three weeks later. The first wheatears are usually reported in Scotland six days after they have been recorded in the south of England.

In other species the difference between the first records of the two countries is greater, in some as much as three weeks or even a month, and I have often noticed that the individuals that occupy certain localities, say a particular garden or thicket even in the south of England, are later in reaching their territory than others in the immediate neighbourhood, which suggests that they travel in different flocks till they cross the Channel and then find their separate ways home. So it is worth while to keep a note of the dates on which you first see or hear the various summer birds in your own district, and to compare them if possible with records from other parts of the country and with those of the reference books.

Another bird also arrives on the 12th of March, the ring ouzel. He is a cousin of our well-known blackbird. His plumage, too, is black, but he has a broad white crescent on his breast. Blackbirds spotted with white feathers and even white blackbirds are not uncommon, so it might be possible to see a blackbird marked in such a way as to resemble a ring ouzel, but you can distinguish the adult males of the two species by their bills. The blackbird's beak is bright orange and the ring ouzel's dull brown.

The ring ouzel is a bird of the moorland, so unless you live in such districts or visit them, you are never likely to see him, except by chance in spring and autumn when he is on migration. If you do, it will most probably be on the coast, just after his arrival, and yet a friend of mine in London looked out of his window early one morning and saw five of these birds in his own garden.

The first of the summer birds to come to the woods and garden is the chiff-chaff, the smallest of them all. The advance flocks of this species reach our shores on the 16th of March, so you may hear its cheerful song a few days

before spring actually comes in. For this reason I consider that the chiff-chaff is the real herald of spring, and every lover of nature should therefore learn his song, so that he may listen for it as the end of winter draws near; for though we know by the calendar when spring begins, there is nothing that gives us so much pleasure or satisfaction as the actual outdoor signs, such as the blossoming of the lesser celandine and the primrose and the appearance and songs of birds which have returned to us after many months.

The song is very simple, just two notes, which sound like *chiff-chaff* or *chip-chop* repeated again and again, with an occasional variation such as *chiff-chiff-chaff* or *chip-chop-chop*. It is a tiny note and is usually uttered while the bird is busily engaged searching for food among the upper branches of trees, so most people would pass it by as just the chirping of a sparrow. The ability to recognise it is, therefore, one of the qualifications of a good observer.

The bird himself is not easy to identify, because he is one of three that are very much alike. The other two are the willow warbler and the wood warbler. They are little olive green birds with yellowish underparts and a yellow stripe above the eye. The willow warbler is even commoner than the chiff-chaff. Indeed, he is quite the most abundant of our summer visitors, and for that reason, and because he feeds more commonly among lower branches and on smaller trees, he is more often noticed than his cousin. He arrives about the 23rd of March. In another week he will become more plentiful and by the middle of April you may see him almost everywhere. He has more yellow on his breast and sides than the chiff-chaff, and his legs are brown whereas the chiff-chaff's are black.

But the surest guide is the song. The two birds have

the same call note which sounds like *hoo-it*, but each has a song of his own and by this you may know him though you may be unable to see his colours. Each note of the chiff-chaff's song is short and sharp. The willow warbler's song is as different as possible from this. It is like a chromatic scale played on a flute from a high note to a low one. It consists of a dozen or more notes each of which is soft and sweet and is slurred into the next one. If you will sing the word "sweet" in such a way, thus,

Sweeee-wee-wee-wee-wee-wee-wee-wee-wee-wee-wee-wee-weet

you will get a good idea of the song, which is one of the sweetest and most beautiful of all our bird melodies.

The wood warbler is larger, but you could not judge by the size unless you were to see the three side by side. This bird is specially fond of beech and oak woods. He is a late-comer and you are never likely to see or hear him before the third week in April. He sings most frequently from the lower branches of tall trees, and his song sounds as if he were trying to say "tree" with a stutter. It goes like,

Tee-tee-tee-tee-t-t-t-t-t-t-trrreee.

The first four notes are slow and the rest are quicker and quicker till they break into the pretty trill at the end. In addition the wood warbler has a very sweet, plaintive call which sounds like *tway* repeated several times.

One of the signs of the coming spring in many parts of the country is the reappearance of the pied wagtail. This bird is not a true summer visitor. He has spent the winter in flocks in milder districts, and as spring approaches these flocks move northward again and scatter. The yellow

wagtail does spend the winter abroad, and he arrives back about the same time as the willow warbler. You will see him in open grassy meadows and pastures. There is another member of the family with which a beginner might easily confuse him, the grey wagtail. Both have bright yellow underparts, but whereas the grey wagtail has a black throat and is bluish grey above, the yellow wagtail is olive green on head and back and yellow underneath from chin to tail. The grey wagtail, however, is not a summer visitor, and he is to be found most commonly near running water.

But the bird we all look for most in these early days is the first swallow. That is because we know its graceful form so well, and it comes and flits to and fro before us so that we cannot help seeing that it has arrived, without any bother of having to search for it. When it does appear, we welcome it joyously, often unconscious of the fact that it is not the swallow. You may see it on the 19th of March and, though it is swallow-like in form, you will know that it is not the swallow but the sand-martin by the fact that its back is dull brown.

The true swallow arrives at the end of March. It is a larger bird, and its back is a glossy dark blue. The forks of its tail are very long, and if you can get a close view of the bird, you will notice that its throat is bright chestnut.

Our third and commonest member of the swallow family, the house martin, reaches this country at the earliest on the 6th of April. The forks of its tail are not so long as those of the swallow and it is not favoured with the chestnut gorget. The feature by which you will know it most readily is a large and conspicuous white patch on its rump. This is the bird that builds a nest of mud under our eaves. The swallow nests on rafters or ledges in barns, and the sand martin places its nursery at the far end of a tunnel

which it digs in a sand bank. So the sand martin is to be seen chiefly in those districts where there is suitable ground for its excavations. In recent years it has shown a tendency to build in the recesses of old walls when it can find nothing better.

Often the sand martin flies considerable distances to hawk for insects where they are most plentiful, over a pond or stream, and there you may see it, in company with both swallow and house martin, and you will be able to pick out each at a glance by the colour of its back. To see this you should wait until they turn, for then they lie over on one side like a yacht and show the whole of their upper parts.

In the first week of April, besides the willow warbler and the swallow, you may see and hear the tree pipit, the blackcap and the wryneck, three very different kinds of bird.

The tree pipit is a little brown bird with a speckled breast. You might mistake him for the skylark except that he has no crest. He is still more like his own first cousin the meadow pipit or titlark, which is common on moors, heaths, downs, and open meadow land. If you know the meadow pipit you must have seen him perform, though you may often have passed him by as just another soaring skylark without noticing the peculiarity of his method. He mounts thirty or forty feet in the air, calling *sip-sip-sip* one might almost think impatiently, and then, spreading his wings and tail, he planes slowly down to the ground or to some spray of gorse, singing all the way. The tree pipit usually starts from the branch of a tree, rises about twenty feet quite silently and then planes down again to the same perch singing a loud, merry song like that of a canary, and, just when he is going to alight, ending with

see-ah, see-ah, see-ah. Sometimes he planes to another tree or to a telegraph wire, or he may rise in the first place from the ground and plane to a perch, or repeat his song many times without leaving his seat.

The blackcap is a warbler. His badge is his black crown, but as he is fond of keeping in the cover of thick bushes, it is often difficult to see him. His song is therefore his chief attraction, and in some respects this is the most beautiful of the whole warbler tribe. A few of his notes are soft, rich, deep and flute-like and will remind you of the blackbird's song. Usually at or near the end of a phrase he sings two notes which sound as if he were whistling "cuckoo." These two notes are the outstanding feature of the song and are the key to the singer's identity, at any rate until you can judge by the general character and quality of his phrases. He is a clever mimic, too; I have heard him imitate perfectly a blackbird that was singing a hundred yards away.

It is well worth while to learn this song early because in the fourth week of April another bird arrives, the garden warbler, whose song resembles it so closely that the two species are often confused even by experts. If you know the blackcap's first, you will be able to compare the two later and then you will quickly notice differences between them. Of course, if you see the garden warbler you need never mistake him for the blackcap, for his head and back are uniform brown. But he is even more given to skulking in bushes than the blackcap, and the leaves come very soon after he arrives. He sings on a lower pitch than the blackcap and the song does not include the blackcap's "cuckoo" phrase ; its most characteristic feature is the bird's decided tendency to roll his r's. In a typical English ballad the blackcap would sing *faw-evah-and-evah* and the garden

warbler *forr-everr-and-everr*. My own preference is for the garden warbler's song. His notes may not be so pure as those of the blackcap, but they are richer and more passionate and the song as a whole is usually sustained much longer than the other.

The wryneck is a cousin of the woodpecker but is not so gaily coloured. He is a little brown bird with a longish, straight bill, and he announces his presence with a loud but rather husky note repeated several times, which sounds like *Sway-sway-sway-sway-sway*. It is useful to bear this huskiness in mind, because his call is otherwise very like one of the calls of the nuthatch and the common call of the lesser spotted woodpecker. The wryneck is known as the cuckoo's mate and country folk say that when they hear his notes the cuckoo's shout is sure to follow.

From this one would gather that the two birds are usually heard for the first time within a day or so of each other. I think this must depend on the district, for though a few stragglers may arrive earlier and may occasionally essay to call, the cuckoo is really a bird of the second week, and even then he waits till the third week before he begins to sing. In Sussex his arrival is associated with Heathfield Fair which is held on the 14th of April. The story is that an old woman of Heathfield kept the cuckoos in a basket and liberated them on the morning of the fair. I lived in Sussex for six years and during that period I never heard the cuckoo before the 17th of April. When I reported that I had heard him on that day, the villagers refused to believe me, the 19th being the recognised date for that district, but at six o'clock next morning they all heard him and admitted that perhaps I had been right after all.

The whitethroat arrives in the second week. When you see him close at hand the white patch on his throat tells

you his name. At a little distance you might mistake him for the tree pipit because he sings in a similar manner to that bird. He mounts from a hedge or a bush, and goes up about ten or fifteen feet and down again, fluttering and dancing like a huge gnat and singing excitedly the while. This exuberant tumbling distinguishes him; the tree pipit's descent is steady and graceful.

The nightingale also comes in the second week and so do the redstart, the yellow wagtail, the stone curlew and the common sandpiper. The nightingale is a plain little brown bird and he sings his wonderful song usually while sitting hidden low down in a bush. He has a very robin-like habit of suddenly popping out of the bushes, alighting on the ground, remaining there for a moment or two to pick up something and then as suddenly popping back again. The redstart has this habit also. Red tail is what his name means, and by this feature you may recognise him at a glance.

The stone curlew is a rare bird. He has to be sought in a few very restricted areas to which he returns faithfully every year. He is always difficult to see even there, because when alarmed he runs along the ground with his head down and at great speed and has wonderful powers of keeping out of sight. But he feeds at night and can often be heard calling after dark.

The common sandpiper is also a bird of a peculiar habitat. He nests on the banks of clear streams, lochs or lakes in the hilly and mountainous parts of the country, but in the lowlands he is to be seen frequently at migration times, and then he is a welcome sight to observers in such districts. He is a smallish bird with olive brown upper parts, light brown breast and white underparts, and he feeds or rests at the edge of the water or in the muddy

ditches of the marshes. He has a habit of bobbing his head and tail, and when he is disturbed he flies out over the water, close to the surface, uttering his clear pipe and showing a white bar on his wings.

In the third week, besides the cuckoo and the wood warbler already mentioned, you may see or hear the lesser whitethroat, the sedge, the reed and the grasshopper warblers, the whinchat, the corncrake, the common and the little terns.

The lesser whitethroat is one of the puzzles of the countryside. With the exception of the Dartford warbler which is not a summer visitor, he is probably the least known of all our warblers, for in colour he is similar to the common whitethroat. In other respects the two birds differ and especially in the song and the manner of delivering it. The common whitethroat's notes are scratchy. His main theme may be described as *awitchit-awatchit-awitchit*. He repeats this frequently as he hunts for food among the branches of hedge or tree, and his full song is an extension of it with sweeter variations, which he utters as he is dancing in the air.

The lesser whitethroat never performs the dance, and the song by which he is most readily identified consists of one loud note repeated six times, thus, *zwee-zwee-zwee-zwee-zwee-zwee* with the accent on the first, third and fifth syllables. It has some resemblance to the opening of the chaffinch's song and might be mistaken for the cirl bunting's by any one whose only idea of that is what he has read in a book. A friend of mine, an excellent observer, says that it always seems to him to be "going round in circles." That is a good description of it when you know it. There is something in it which suggests the whizzing of a string of chestnuts swung round and round by a boy.

Frequently this phrase is preceded by a few harsh warbling notes which are reminiscent of the common whitethroat's *awitchit-awatchit*. The warble, too, may be sung alone and extended indefinitely. I have watched a lesser whitethroat industriously feeding for an hour on one tree and all the while expressing his satisfaction or disgust in a more or less continuous stream of scratchy and screaky observations. That is to his discredit. A bird that can sing so sweetly as the lesser whitethroat ought long ago to have given up all such amateurish scratchiness, and yet even the blackcap and the garden warbler are far from blameless in this respect. I am not now referring to the lesser whitethroat's six-note rattle which is generally accepted as his song. He has quite a distinct song which is a real warble. It is well sustained and very beautiful and sweet, but it is so soft that it is almost inaudible at a distance of a few feet. This cannot be intended for the ears of his rivals, but must be sung either for his own pleasure or for the private entertainment of his mate. When you have made his acquaintance you will be amply repaid by this charming solo for any time you may spend in his territory waiting for him to drop into the happy mood in which he sings it.

The sedge warbler and the reed warbler are another of the fascinating problems which bird lovers have to solve by careful observation. They are both waterside birds and for this reason they are often confused by beginners, yet there are several unmistakable signs by which they may be known. The reed warbler is uniform brown above and white underneath. The head and back of the sedge warbler are streaked with dark markings and there is a conspicuous white mark above his eye. This eye-stripe is the feature to look for first.

As his name implies, the reed warbler is specially fond

of reed beds. He may also be found in patches of osier. Once he settles down in such quarters he seldom leaves them till the time comes for his southward migration. A reed bed at the end of a lake may accommodate several pairs. There they move about among the serried stems and seldom show themselves except when the cock sidles up to the top of a reed to sing. His song is not musical and suggests rather the whirring of some kind of machinery heard at a distance. It consists of several short, jerky phrases and is repeated time and again with very little variation. The most characteristic phrase, or at any rate the one that is most noticeable and most easily remembered, is *chirra-chirra.*

The sedge warbler is not so restricted in his choice of a home. Wherever there are osier beds he is sure to be there, but he is just as fond of bushes, whether they grow separately or in thickets, so long as they are in the vicinity of pond, stream or marsh. He is not afraid to show himself when you pass anywhere near his nesting ground, and he will sing at you in an excited manner as if he were scolding you off his premises. His song is loud and varied. Some parts of it are musical and pleasing but others are harsh. Part of it resembles the reed warbler's song, and this part is often sung by itself, hence the confusion. If you bear in mind that the reed warbler's song is jerky you will quickly learn to distinguish the two.

The grasshopper warbler is fond of marshy ground too but prefers such as is overgrown with small bushes. I have seen and heard him, however, in a small roadside plantation in a dry chalky district in Sussex, and he also frequents moors on which the tallest plants are heather and bog myrtle. Nevertheless, wherever he may be found his song is unmistakable. It is one long sustained note which is

best suggested by the familiar sound of a lawn-mower working some distance away. It may last for half a minute or less, but often it is uttered continuously for more than two minutes. During such long periods it may drop a fraction of a tone and a little later may rise again. This effect is also characteristic of the churring of the nightjar. I have often thought that in both cases it might be due to a change from exhaling to inhaling the breath and vice versa.

The grasshopper warbler is a plain little bird, brown in general colour and, to the majority of people, would pass for a sparrow, or to those a little more experienced, as a reed warbler. You may recognise it by the fact that the tip of its tail is rounded.

The stonechat and the whinchat are closely allied members of the thrush family. The stonechat remains with us all the year round, the whinchat migrates. Both are fond of gorsy commons, moors and railway embankments, and the whinchat also frequents meadows. They are about the size of the robin, and have the robin-like habit of dropping to the ground from a low perch and returning quickly after picking up a mouthful of food.

There is no possibility of confusing the cocks of the two species, for the male stonechat has a handsome black head, a white collar, a white patch on his wings and a chestnut breast, and in comparison the male whinchat is inconspicuous, his general colours being dark brown streaked with buff. The female stonechat, however, is much more modestly plumed than her mate and might easily be mistaken for the cock whinchat. The most obvious distinction between the two is the fact that the whinchat has a bold white or buff stripe above the eye.

The first intimation of the corncrake's arrival is his

loud, insistent, harsh call of *crake* repeated monotonously from the long grass of meadow or hayfield. In the open country it is a welcome sound always in spite of its harshness, but if the bird happens to take up his quarters in a meadow overlooked by a bedroom, it can become very trying in the early hours of the morning.

This bird long had the reputation of being a ventriloquist, for as you listen to him, his call now comes from a spot not many yards away and the next minute it is sounding from the other side of the field. This seeming miracle is simply explained if you have the patience to watch until you see the performer. His habit is to turn at intervals as he calls so that the sound may penetrate to all parts of the field. Patience is required because, though he is a bird of considerable size, he keeps so well hidden among the long grass that he remains a mystery to many people who spend their whole lives in the country.

The terns are birds of the coast. A more popular name for them is sea swallow. They are not in any way related to the swallow, but they merit the title by their graceful forms, their long, narrow wings and their forked tails. By these features, and especially by the wings, they can be distinguished from their near relatives the gulls, which they resemble in general colour.

The tern's head is black and because of this the birds may be confused with the black-headed gull. The "black" of the latter species is chocolate and it forms a hood which covers the whole head and throat. Only the top and back of the tern's head are black. These are features that have to be looked for. Another sign is the manner in which the terns secure their food, and this is often the first thing that attracts attention to the birds. They feed almost entirely on fish which they capture by diving from a

height. Their habit is to fly along twenty or thirty feet above the water, and when they spy a likely prey, they hover for a second or two and then plunge headlong into the water. This sudden drop is characteristic of the tern and distinguishes it from the gulls which always alight cautiously feet first.

In the fourth week of April at least six more birds should arrive, the garden warbler already described, the spotted and the pied flycatcher, the swift, the nightjar and the turtle dove.

The word "spotted" is misleading when applied to the common flycatcher. It describes correctly the young birds whose juvenile plumage is speckled all over. The adult is a plain brown, gracefully built bird with a greyish white breast and a few barely noticeable streaks on the head, but no spots. It is a remarkably silent bird and would therefore be passed by unnoticed by most people but for its peculiar method of hunting.

Most other insect-eating birds seek their prey on bush or tree or on the ground, and the swallow and the swift pursue theirs constantly on the wing. The spotted flycatcher perches on a post or branch or fence and waits patiently until some flying insect comes within range. Then he swoops down on his victim, captures it with a decisive snap, swings round in a graceful curve and returns to his perch.

The spotted flycatcher is fairly common in most parts of the country wherever there are trees. The pied flycatcher confines its visits almost exclusively to certain limited areas, valleys in the hilly country of central and northern Wales, northern England and southern Scotland. A few pairs nest in Devon every year, but in most other English counties the species is only a rare visitor. It seems to like the

Spotted Flycatcher.

vicinity of running water. The cock cannot be mistaken for any other British bird because of his bold black and white plumage. This conspicuous coat, one would think, must be a great danger to him, especially when combined with his habit of hawking which constantly exposes him to attack, but instead of minimising his risks he has added to them by composing a sweet and cheerful song which he repeats frequently. The spotted flycatcher has a song too, but it is so slight that very few people have ever heard it.

It is easier to date the arrival of the swift than of almost any other bird. One day you know definitely that he is not here and the next you know definitely that he is, for you cannot help seeing him as he rushes to and fro above the house-tops in pursuit of insects, even if he does not announce his presence by his wild, joyous screaming. He is brownish black and has long, narrow wings and a short forked tail.

The nightjar is probably a distant relative of the swift, but in some respects it seems to have affinities with the owls. It is to be found throughout the country wherever bracken is plentiful either in open woodlands or on heath-clad wastes. During the day it sleeps on the ground where it is marvellously hidden by the similarity of its plumage to its surroundings. At dusk it mounts to a perch either on a post or a branch, and announces its wakefulness by its curious churring. This note, which suggests a soft and mellow form of showman's rattle, is loud and carries long distances, so it may be heard and noted by observers who live in the neighbourhood of the nightjar's favourite haunts but who have never seen the bird itself. It is similar in character to the thinner and shriller song of the grasshopper warbler and may be expressed as *urrr*. When this has been held for a minute or more, it will suddenly be

changed to *errr*, which is sung a tone or so higher, and presently, after a shorter period this will be changed back to *urrr* without even a momentary pause. Those who care to go into the woods at dusk will hear this mysterious bird make two other sounds. One is a call uttered with the mouth and suggests the creaking of a door, thus, *ge-eck*. The other is caused by clapping the wings over the back as the hunter flies leisurely across an open glade.

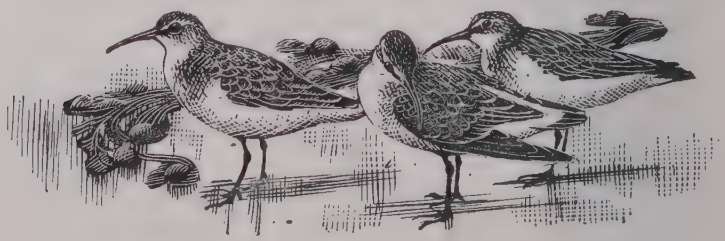
The turtle dove's arrival is also usually first announced by its characteristic note, which is an often repeated *turr* resembling the purring of a cat. It is a soft, drowsy note which is peculiarly pleasing on a hot summer day. This bird nests in high, untrimmed hedges and bushes and feeds in open fields where, in the southern half of England, it is often very abundant. It is distinguished from our resident pigeons by its smaller size and the fact that its general colour is brownish, and, as it flies away from you, it may be recognised by its tail, which is black with white edges and tip.

The arrival of our summer visitors by no means ends on the 1st of May. One rare bird, the marsh warbler, does not reach our shores before the first week in June, and the red-necked phalarope, which breeds in the north of Scotland, may be expected at its nesting grounds about the fourth week of May. The dates I have suggested for the April species, however, are all early, so flocks of these birds will continue to pour in for a fortnight or three weeks after the reported appearance of their forerunners. This carries the ordinary spring migration of common birds well into May.

Meanwhile, during April another phase of this romantic movement has set in. This is known as passage migration, and it continues until well into June. Most of the species

which visit us in summer also nest in Scandinavia, and the coasts of Great Britain are regular routes by which they travel to their breeding grounds in the far north. The flocks which make this further journey generally arrive on our seaboard later than those that intend to nest here, and they may be observed passing along northward weeks after our own birds have settled down to the serious business of the season. Those that go by the east coast set out on their long voyage across the North Sea from our north-eastern shores, and those that pass up the west coast proceed through the Orkneys and Shetlands. Some species then go by way of the Færoes to Iceland and Greenland, but most strike north-eastward and make for the Norwegian coast.

Other birds which never nest in this country likewise use our coastal routes to the north. One of them is the Norwegian blue throat, a relative of the nightingale. Another is the curlew sandpiper which nests in the north of Siberia. These passage migrants are in so great a hurry at this season, pushing on eagerly to reach their distant nesting grounds where the summer is late and very short, that we have few chances of seeing them. When they are returning southward they are much more leisurely and spend many days with us. I will therefore deal with them more fully in a later chapter.



CHAPTER THREE

SPRING SONG

I NEVER tire of listening to the songs of birds, and every year I learn something new about them. The sweetness and the musical phrasing of their notes have a charm that is always fresh, and as they come straight from the heart we take them straight to our own, and, sharing the gladness and the happiness of the singers, we realise more fully and feel more keenly the beauty of the world and the joy of living.

That pleasure can be experienced by any one with an ear for beautiful sounds though he may not have enough knowledge of birds to distinguish one song from another. He can add to it indefinitely by learning the songs; for each one he masters will afford him infinite delight every time he recognises it. In addition he will have the lure of the hunt while he is making his collection, and a never-failing satisfaction in the very ability to identify them. But beyond this he will find much more in bird song that is worthy of his attention. He will not go far in his study, for instance, before he discovers that each species has its own periods of song.

As I have already shown, each begins about the same date every year. The missel thrush sings during winter and spring; he is said to stop in April and to be silent in May and all through the summer. My own earliest record of hearing him sing is the 20th of November, and my latest the 14th of May; but generally I consider that he is in full song from Christmas to the beginning of May.

This habit of the missel thrush is curious, because it means that he ceases to sing just when all other birds are at the height of their power. It is well known that he is fond of stormy weather, and he may often be seen on a wet, gusty day sitting on the swaying tip of a tall tree and piping lustily to the blast. We ourselves know the exciting effect of a walk on such a day, how the buffeting of the wind and the driving of the rain make us glow and tingle till at length we become eager to do great things at the top of our strength. The rooks feel this too, and when a strong breeze is blowing you are sure to see them tumbling about in the air and calling joyously from sheer delight in the tussle with such a mighty force. It is this that sets the heart of the missel thrush thrilling and causes him to dare the storm on his tossing tree-top and to sing there so bravely, so ringingly and so zealously when most other birds are sheltering among the bushes. At such times his song is at its very best if only you can hear it above the noise of the wind. But he does not by any means wait for a gale. He may be heard on days when there is no breeze at all, and the 14th of May of my record was a calm, warm, sunny morning. And yet there are many spring days on which you may hear song thrushes everywhere, and not a single missel anywhere. The song thrush too is inspired by windy weather; I have many times heard him singing in a gale. It might be possible to find an explanation of the

missel's varying moods by keeping a diary of bird songs and afterwards comparing the conditions that prevailed on the several occasions on which that bird was silent.

The enthusiasm of the skylark and the quality of his song vary with the seasons. In January the larks are still living in flocks; but even then, if the weather is mild, you may often see one or more fly up and, while fluttering to about thirty or forty feet from the ground, sing in a half-hearted kind of way, as though they are not quite sure whether it is right to be singing at that time of year. About the beginning of February, if the weather is still mild, they begin to scatter, and then you may see them springing up from the fields at every few yards. Some of them drop again after singing only a short phrase or two; others rise fifty or a hundred feet and sing heartily for a time, beating joyously round in wide circles, now in one direction now in another, then suddenly become silent and swoop quickly to the ground. As the season advances they soar higher and higher, but you will notice that even when they go very high they still come down quickly. They do this either by closing their wings now and then and dropping ten or twenty feet, or by lowering one wing and side-slipping a few feet, then, after balancing for a moment or two, lowering the other wing and side-slipping again and so on till at last, when they are only about fifty feet up, they stop their song short, close their wings and plunge like a stone to the field below. Sometimes they break off when they are much higher; I have seen them dive in one long, swift swoop from a height of at least two hundred feet, still singing in an absent-minded manner as they flashed through the air.

During the spring their song is not nearly so joyous while they are descending, and when they break it off you

feel that it is a pity but that after all they were tired. It is never quite so joyous at any season, but in the warm sunny days of May and June, it very nearly is. Then they soar up and up till they are almost, if not quite, out of sight, and sing continuously from the moment they spring from the earth till they come back to within a few feet of it, or even sometimes till their toes are again almost touching the grass, and the song may last for ten minutes or more. In July they lose much of their enthusiasm. They no longer climb high in the air, but often carol from a gorse bush or hedge, or while sitting on the ground or hovering only a few feet above it. In August they cease singing, but resume for a little in September, and in October or November they flock for the winter.

The robin sings throughout the year, for though the elders may be silent in August, the youngsters experiment even while they are moulting. Wrens and hedge sparrows also sing during the winter, but not so frequently nor so constantly as the robin. The starling may be heard singing in all months, but only occasionally in the height of summer. The song thrush sings tentatively in autumn and early winter and in mild weather is in full song in January; the blackbird begins in February. Both these birds fall silent about the third week in July.

After the missel thrush the next to drop out of the chorus is the blue tit. There are so many beautiful songs everywhere in May and June that the voices of the tits are liable to be lost among them. So the blue tit may perhaps continue into June, but my own latest record of its song is in the last week of May and my impression is that most of this species are silent earlier than that. The other tits may be heard occasionally in June.

There can be no mistake about the nightingale. At his

chosen hour he has no rivals and his song is so loud and clear that we cannot fail to hear him if he is within earshot. So we listen to him every night in May if the weather is favourable and often when it is so cold that we might think it was not favourable. Then one night in the first or second week of June we miss him. I know of records as late as the third week in June but I think these must be exceptions, or must have been made in exceptional seasons.

All the warblers may be heard singing up to the middle of July. After that they drop out one by one. Among the first to go are the lesser whitethroat and the wood warbler and the last are the blackcap, the sedge warbler and the reed warbler. I have heard the willow warbler and the chiff-chaff on the last day of July, but generally the latest records of these birds are in the second or third weeks of the month.

In the first few days of July also we may still hear an occasional cuckoo, at any rate in the south-east of England where most of my notes have been obtained, and for about a fortnight the chaffinch and the goldcrest. The tree pipit continues to sing for a few days longer, but I have not heard it in the last week of July.

In August the silence of the countryside is so noticeable that the song of the goldfinch is almost startlingly beautiful. This bird sings enthusiastically and brilliantly during the greater part of the month. I have seen it stated by a good observer that the goldfinch is at his best in July. If this means that he sings better in July than in May I cannot confirm it, for one of the most delightful experiences of the countryside is to listen on a bright morning in May to the beautiful song of the goldfinch bubbling out like liquid sunshine from among tall trees clothed in their newly opened, fresh-green leaves. But in the latter half of

July and still more in August, his song, which has lost none of its brilliance, is relieved from the competition of its rivals, and rings out so clearly that it seems to be something new, and we welcome it with as much joy as we do in April the first notes of the nightingale or of the cuckoo.

A more familiar songster of August is the yellow-hammer. His plaintive notes may be heard all through the month on commons and roadsides. His cousins, the cirl bunting and the corn bunting, also sing for the greater part of August. Indeed, I have heard the cirl bunting's full song in Cornwall as late as the middle of September. The reed bunting gives up at the end of July.

Several birds habitually resume their songs in Septemper after a period of silence during August. These include the chiff-chaff and the willow warbler. The swallow, however, sings right through the summer, and well into September if the weather is favourable.

As I have already said, most of my notes have been made in the south-east of England, many of them in Surrey and Sussex. Comparison with other parts of the country might show that the song periods vary in different districts. Probably they are shorter in the north and perhaps they are longer in the west.

Every species also has its daily periods of song.

One summer during the Great War I had to do sentry-go many times outside the gates of a castle that stands on a wooded peninsula and guards an important harbour on the south coast. Now, a guard is on duty for twenty-four hours, and in that time each sentry has to take post for four periods of two hours. So, whenever I had the chance, I chose to go out from ten to twelve and from four to six. I had two reasons for this. One was because between ten and twelve at night I was kept so busy challenging late-comers that

the time slipped by quickly, the other that between four and six in the morning I was able to watch the dawn and to observe what was happening before and after sunrise. For though it was four to six according to summer time, it was three to five by the sun.

The first morning on which I did this was the 24th of June, and when I was left alone at my post at four o'clock, the sun had not yet risen, but a cold grey light was gradually spreading over the sky. At twenty-minutes past four a thrush began to sing. A minute or two later other thrushes took up the challenge and at half-past four a blackbird that had a nest near me awoke and, after a few *tuck-tucks* and two or three short flights from branch to branch, settled on his favourite perch and joined in the chorus. He was closely followed by other blackbirds and by the robins. At twenty minutes to five the chiff-chaff started calling; at quarter to, a magpie announced with a clamorous chattering that he was awake, and at ten minutes to, I noticed swifts in the air. Last of all, very much to my surprise, at ten minutes past five, almost an hour after the first thrush began to sing, the sparrows appeared and at once became very noisy.

I did not see the swifts actually leave their nests, for the roofs under which they had made their homes were at some distance from me, but I am sure that one minute they were not on the wing and the next they were, and seemed to be already hard at work hunting for breakfast. The magpie also wasted little time. He chattered noisily at his nest, then flew to a particular tree which he used regularly as a scouting post, paused there chattering for a moment or two while he made sure that the coast was clear, then disappeared in the direction of the cookhouse, where no doubt he was able to pick up scraps before the cooks were

astir. But the blackbirds, robins and thrushes made no attempt to catch the early worm. Instead, they sang for pure joy; the sun had come back, they were refreshed by their sleep and it was good to be alive. They may perhaps, at the same time, have been asserting their right to their own chosen territories and warning off rivals, but there was no suggestion of this in the quality of their tones, and when all birds are singing together in one general chorus, as happens at dawn in more populous areas, such challenges can have very little value.

I was at the same spot a few mornings later at the same hour, and the order in which the birds woke up then was almost the same. The same thrush began to sing at exactly twenty minutes past four, and the chiff-chaff started to call at twenty minutes to five. The blackbird was fifteen minutes later than before and this puzzled me at first, but he did not sing that morning. He had given up music for the season, so he may have been on the move for some time before I noticed him, but I am certain that his first *tuck-tuck* was sounded at the time I have given. The robin also was a few minutes later and the sparrows a few minutes earlier than before.

On the 14th of July I was again on the same spot at the same hour, and this time the morning was dull and cold and a soft misty rain was falling. I listened and watched for the first stirring of life and at nineteen minutes past four I had my watch in my hand, for I fully expected to hear the first note of the thrush's song at twenty past. But the minute passed and nothing happened, then another and another, then five, ten, twenty and twenty-five minutes, and still there was not a sound. I began to wonder whether this time the sparrows would be first, but at thirteen minutes to five the thrush broke the silence, the same

bird as had led the way on the two previous occasions.

The blackbird was awake at three minutes past five, but did not sing, and the next was the wren which was piping at fourteen minutes past. The robins were astir at twenty-five past, the chiff-chaff was calling at quarter to six, a carrion crow flew overhead croaking at twelve minutes to, the magpie crossed the road to his scouting tree at five minutes to. At the same time I noticed the swifts swinging to and fro in the air above their nesting places, and when I was relieved at six o'clock and marched off into the guard-room, the sparrows had not yet put in an appearance. So on that miserable morning all those birds had been human enough to take a long "lie," and I believe I thought all the more of them for it.

The records of these three mornings show that at that season and in that particular place, the various species of bird had each its own habit of beginning the day. At other seasons and in other neighbourhoods, the order in which they wake may be different. There was no skylark on the peninsula so I can give no time for that bird's rising. Others have recorded that he frequently begins to sing before dawn and one good observer states that the swallow does also. I have often been awake at dawn in more crowded neighbourhoods and there my impression has always been that the first singer was the thrush and that a few moments later the whole air was full of glorious sound, a chorus which lasted for about an hour and then ended almost as suddenly as it began. But listening from bed is not satisfactory. The only way to be sure of what happens at dawn is to be up and out before it breaks and have watch, notebook and pencil in your hands.

It is not so easy to make useful records at other times of the day. My experience has always been, however, and I

have heard other observers say the same, that birds seem to be more plentiful in the morning and forenoon and in the evening than in the afternoon. That is an interesting point if it can only be proved, but it may be merely an idea we have; it may be that on a number of afternoons we have been unfortunate and seen few birds, and because it has happened several times we have been left with the impression that it is generally so. I myself have seen birds asleep in the afternoon, and I have never found any in that state in the forenoon except owls and waders. In summer birds are late to bed and early to rise, so during the night they have very few hours for sleep. The probability is, therefore, that they work hard up to midday, rest or snatch forty winks in the afternoon if they are not disturbed, and become active again in the cool of the evening.

When dusk creeps in some birds go earlier to bed than others, but I have regularly heard robins and thrushes singing long after sunset and right through the dusk until darkness has actually fallen. I have even heard a robin wake up in the middle of the night and sing. Unfortunately I have no careful records of these observations; it did not occur to me then to look at my watch and jot down the hour and the minute. Others have recorded the hedge sparrow, the wren, the blackbird, the skylark, and the martin as occasional night singers.

Besides the nightingale and the nightjar, several species sing habitually at night. The grasshopper warbler does and so do the sedge and the reed warbler. When I have been out after dark listening to these birds, I have frequently heard the drumming of a snipe overhead. This, of course, is not a song, but it is the equivalent of one.

In the height of summer the nightjar wakes up and begins to churr about ten o'clock at night. During the day

he hides on the floor of the wood. He sings at night because in that period of the twenty-four hours he feeds and lives. The nightingale is not nearly so narrow in his interests. In spite of his name, he is by no means only a bird of the darkness. He sings by night because he chooses to do so, and he earns his living while the sun is up. You may hear him singing in snatches at all hours of the day. Once I heard a nightingale and a garden warbler competing against each other about six o'clock in the evening. They were only a few feet apart and I was not more than five yards from both. It was a great experience, and I have never heard either bird sing better. Nevertheless, in ordinary circumstances, the nightingale is at his very best after dark when all his rivals are asleep.

A story is told of a Scots farmer who, during a visit to the south of England, was introduced to the nightingale. On his return home he announced: "I wadna gie the wheeple o' a whaup for a' the nightingales that ever sang." Those who know the whaup, that is the curlew, in its summer haunts, will understand and sympathise with his patriotic preference. I must confess that I experienced a similar disappointment when I first heard the nightingale, largely owing to the influence of Keats and other poets. Keats's *Ode* still gives me the impression that the song to which he was listening was a long-sustained, passionate serenade, something after the manner of the skylark's only more wonderful. So when I heard my first nightingale I was astonished to learn that he breaks up his song into a series of short phrases with a considerable interval after each. I could not but admit the beauty and the brilliance of those phrases, but I was shocked by the hardness and soullessness of the notes. Hardness and soullessness are failings of brilliant human musicians, but, nevertheless, I think the

nightingale's song suffers from the circumstances in which the bird elects to sing. The stillness and the sharp, clear May night air affect the sounds, crystallising them and so intensifying their natural hardness.

I have modified my opinion of the nightingale's song since I first heard it. The cleverness of its phrases and the brilliance of its technique cannot be gainsaid, but still I fail to find in it the soul with which the poet's imagination has invested it. There are several common birds whose songs I prefer, among them his relatives the blackbird, the robin, the missel thrush and the song thrush.

There is a family likeness in the songs of these five birds. Each consists of a series of phrases divided one from another by distinct pauses. The nightingale selects a different phrase after each pause. If you listen carefully to a robin you will notice that he does the same, though his changes are not so great nor so striking at those of the nightingale and the thrush. The thrush repeats each phrase at least once, but often several times before passing to another. I have heard one in winter utter a single phrase a dozen times in succession. The missel thrush has a more limited range and changes less frequently, and the blackbird has a few exquisite notes which he uses over and over again but with infinite variation. On the whole the song of the nightingale is most strikingly akin in character to the thrush's, and the robin's and the missel's to the blackbird's. The family likeness is not so noticeable in the singing of the redstart and the stonechat ; their songs are more finch-like than thrush-like.

It is difficult to trace relationship among the finches by their songs, but it is simple among the buntings. The common bunting, which in this country is common near the coast and in certain island districts, sings,

Chip-chip-chip-cherry-erry-er-y.

His song is sometimes described as like the rattling of a bunch of keys, and though this gives a good idea of the latter part, it omits the *chip-chip-chip* which is important in itself but is also the family characteristic. The yellow bunting, or yellowhammer, the most familiar of the group, sings,

Chip-chip, chip-chip, chip-chip, chi-EE-peese.

The cirl bunting, which is not nearly so well known, though he is found in many of the counties in the southern half of England and also in Wales, simply repeats the *chip* quickly nine or thirteen times. His is a sweeter note than the yellowhammer's, and though the phrase lacks the charming finish of that bird's song, it does not end abruptly as some writers would have us believe. The number of repeats is so well chosen and the accent so placed as to make a well-balanced whole. The reed bunting, as his name implies, has to be sought in marshy neighbourhoods. His typical song is *Cip-chip-chissick*. I used to know one on a Surrey common that habitually sang seven notes. They formed a charming phrase which at the time I rendered as *Sweet-sweet-won't-you-COME-with-me*. After the opening bar, it ran up to *COME* and then dropped. Frequently it was varied by the insertion of two more notes and became, *Sweet-sweet-won't-you-come-and-LIVE-with me*. In addition to the characteristic preliminary notes, there is a minor strain running through all the songs of this family which in itself would serve to distinguish them. The most cheerful of them is the cirl bunting's and that is made up of preliminaries.

Armed with these interesting facts we might bolster up a theory of descent, even making a certain amount of play

with the songs of the finches. We should find confirmation when we came to study the warblers, in the remarkable resemblance between the songs of the blackcap and the garden warbler, a likeness that is tantalising to every one but an expert. In a lesser degree there is resemblance between these songs and those of some other warblers, such as the whitethroat and the sedge warbler. They are all clearly songs of the warbler family.

But what are we to think of the grasshopper warbler's song ? This curious reeling note is at once disconcerting and comforting; disconcerting because, as I have already suggested, its nearest relative is the song of the nightjar which belongs to the owl tribe; and comforting because of its bold originality in a family which is highly gifted but whose genius tends to run on consanguineous lines. We might argue whether it was the grasshopper warbler or the nightjar that had tried to imitate the other, or whether both had aped the frog, and considering the wonderful powers of mimicry possessed by some members of the warbler family, we should probably find the balance against the former. But even so it would be a great satisfaction to know that the song had not been derived by descent from the common ancestor of all the warblers. The common ancestor has become so much a convention among writers on Natural History that it is refreshing to be able to treat him with suspicion.

When we apply the test to three of our birds that seem to be most nearly related, the willow warbler, the chiffchaff and the wood warbler, we are completely nonplussed. These birds are so much alike in plumage that it is almost impossible in the open to identify one apart from the others except by its song, but in each case this is quite distinctive. The willow warbler's soft refrain is a warbler song, but

the trill of the wood warbler suggests affinities with the finches and the cheerful *chip-chop* of the chiff-chaff might be the note of a cultured sparrow.

Taken as a whole the songs of all these birds, thrushes, warblers, finches, larks, wagtails and pipits, have something in common. There is a similarity in their general character and a degree of refinement which might be expected of a race that has been accustomed to the joys and comforts of open woodland and cultivated land and has made considerable advances in other arts. Such birds as the skylark, the stonechat, the wheatear and the reed warbler, which are found on heaths, moors and marshes, are pioneers that have pushed out into the wilderness and have carried their civilisation with them.

But the wilderness has a race of its own, the great group of waders—curlew, redshank, dunlin, plover, etc. Here again we can trace a family likeness in the calls and songs of the various species and find that the music is peculiarly suited to the nature of the country. The notes have a beautiful quality, but they are wild and melancholy, as if the birds had become imbued with the spirit of the dreary wastes in which they spend their lives. Even when the songs are fraught with the joy of spring they cannot escape this influence, and they are barbaric in character compared with the happy refrains of the birds that live in more genial surroundings.

A better comparison is found within the wader family itself. Just as the stonechat and the wheatear are thrushes which have struck out into the wilderness, so the pigeons are plovers which have advanced into the fields and woodlands. They are now placed next to the waders of which the plovers form a large group. The family likeness is not obvious when the pigeon is compared with the lapwing,

which is popularly called the plover though it is rather an outlying branch of the tribe, but a general resemblance is traceable between the common ringed plover of the seashore and, say, the wood pigeon. There is also a resemblance and a striking difference between the songs of the two birds. The ringed plover's is *turrapoora* repeated several times wildly and rapidly and with a strain of the wasteland melancholy running through it. The wood pigeon's is

Kru-krooo-krooo-krukru, kru-krooo-krooo-krukru, kru.

Thus set down, the likeness is not apparent, but the *turr* of the turtle dove links the two, and when you know the three well, you will have no difficulty in realising that the wood pigeon's crooning lullaby is a plover note, softened and mellowed by a rich and bounteous environment.

The ringed plover spends its life on the seashore, though at migration periods it may sometimes visit the banks of inland waters, and in winter most of the waders feed on the mudflats and sand at low tide. There they meet and mix with the birds of the sea which also have characteristic and appropriate calls. What could be more in keeping with the wild and restless ocean than the harsh screaming of the gulls and the terns ? These birds are waders which have taken to a seafaring life, and it may be possible to find among them some trace of wader notes, for example, in the cursing of the black-headed gull, the *kreeerr* of the common tern, the *kleeaw* of the herring gull and so on, but this time the notes have been hardened by a cruel and relentless environment.

The manner in which birds sing is also affected by their environment, but within the limits thus set there is plenty of scope for racial differences and individual choice. Of the

three closely allied warblers, willow warbler, chiff-chaff and wood warbler, the first two sing while they are at work, hopping along the branches or flitting from one to another in search of insects, and sometimes they are high up and sometimes low down. The wood warbler perches to sing, and he usually selects a lofty tree and a bough that springs from it far above the ground and yet is the first on the tall, bare stem.

The reason for this is that whereas he hunts among the upper branches of the wood, his auditorium is the great silent cathedral below with its serried pillars of mighty trunks. He lives most commonly in beech woods and there his voice would be lost among the waving branches and smothered by the blanket of leaves, which are so cleverly arranged for catching the maximum amount of light that not enough can pass them to enable undergrowth to flourish. But with this close-set leaf blanket serving as a sounding-board overhead, his shrill little voice rings out far and wide among the unencumbered trunks. His nest is on the ground. It might be said that he mounts to the nearest perch to sing. What actually happens is that, as he spends most of his time feeding in the tree-tops, he descends to his perch at intervals.

This is the opposite of what most birds do ; instead of coming down they go up, and each chooses a perch at his own favourite level. The common wren feeds on or near the ground, usually at the roots of a hedgerow or among the undergrowth of a wood, and he lilts his loud, clear song with its merry trill, from the curving stem of a bramble or some protruding twig about midway up the hedge. The robin and the hedge sparrow sit on the crest of the hedge or the lower branches of the smaller trees. The yellowhammer is also a hedge-top bird, but he seems

to prefer the higher parts, such as the crown of a thorn-bush growing out of it. The chaffinch aims a little higher and pipes his challenging notes most often from the lower branches of the taller trees, and the greenfinch calls and sings from their tops and often while fluttering in wide circles at the same level. The swallow twitters from the cottage roof, the starling whistles from the chimney-pot, and the blackbird and the thrush are happiest on the top-most twig of the tallest trees. The skylark soars a thousand feet into the air carolling fervently as he ascends and descends. The meadow pipit, springing from the ground or from some gorse, mounts thirty to a hundred feet and sings while gliding downward, with outstretched wings and upraised tail, to his starting point. The tree pipit perches on a tree-top at the edge of a wood or in a hedge or park and, either there or while gliding back to his perch after taking a slanting flight upwards twenty or thirty feet above it, pours forth his beautiful song with the utmost fervour and a restless display of the greatest excitement. And the little whitethroat flings himself up from the hedge, and while he is fluttering up ten or twenty feet and down again, his notes bubble out wildly and warmly. The nightingale and some others prefer to hide in thickets. I have succeeded in watching a nightingale while he was singing, but though I have often heard and seen the grasshopper warbler at close quarters, I have only twice been able to study him in the act of reeling.

These are rules, but if you are a true lover of birds you will rejoice to know that they are constantly being broken. Each species inherits certain habits and powers of voice which it practises instinctively; but you cannot compare several of the same species without discovering that every individual has ways of its own.

The Meadow Pipit.

I have already mentioned the slight variations that frequently occur in the simple song of the chiff-chaff. These may be used by every chiff-chaff and probably are. They are not introduced at regular intervals, however, but always at the will and according to the fancy of the performer. All other birds vary their songs; indeed, variation is the essence of thrush song. Certain phrases are traditional in each species, but every individual has his own way of rendering them. If you compare two nightingales or two thrushes you will notice that they do not repeat their phrases in the same order, that they vary them as they please and that each has special phrases of his own. And if you carry the inquiry further you will find that there is something like dialect among birds. The songs vary not only according to the idiosyncrasies of the individual performer but also according to district. When a song is elaborate comparison is difficult, but it is easy to retain in the memory the typical form of such short and simple songs as those of the chaffinch and the yellowhammer. I have given the typical chaffinch song as

What-what-what-what-d'you-r-r-r-r-really-think-of-ME-now.

Some individuals, and in certain districts most of the species, sing a less pleasing variant of this. It sounds like

What-what-what-what-do-you-r-r-r-r-really-swear,

the final r being clearly pronounced.

The yellowhammer's song provides even better examples of variation than this. I have seen it described in a book by a well-known naturalist as a "changeless tune." Others speak of it as monotonous. I have never found it either the

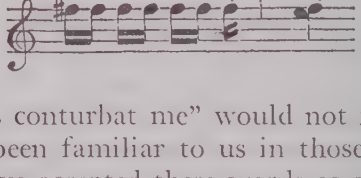
one or the other, though I have often listened to it for an hour at a time while resting or lunching on roadside or common.

As a boy I was very familiar with this bird. At a certain spot in the east of Fife where I spent some happy summer holidays, about six miles inland from St. Andrews, he was as common as the chaffinch, and in my walks I always stopped to listen whenever I heard him singing. In those days we used to describe the song as "Timor mortis conturbat me," which is the refrain of an old Scotch poem made at a time when it was still rather vulgar to write in any tongue but Latin, and the plain English of it is, "The fear of death encompasses me." The words were not our own choice; they were fitted to the song years before our time by a scholarly man and a lover of literature and of nature, and they gave such a good representation of it as we knew it then that we readily adopted them. Besides, they suggested its plaintive quality which is its greatest charm and, being poetical, they are more in keeping with the idea of a wild bird singing wistfully in the wilderness than the popular serio-comic "A little bit of bread and no cheese." The phrase that was so familiar to me in those days was:

I noticed certain little variations. Sometimes the final double note was not sounded, sometimes there were only three pairs of the first note and sometimes as many as six pairs, and sometimes when the complete song had been sung, a little shrill note was added as if the last were being doubled quickly an octave higher. A bird will often repeat the song in this form many times without change as if the

effect of the final grace note pleased him well, but if he is disturbed while he is so engaged, he will go back after a pause to the common and simpler version.

The Surrey birds introduced me to a new form of the song. With them the high note is a regular and important part of the theme, but instead of being a grace note tacked on as an afterthought to give a finishing touch, it takes the place of the second last note and is considerably prolonged, thus,



"Timor mortis conturbat me" would not fit this version, and if it had been familiar to us in those early days we could never have accepted these words as a suitable interpretation of it, but it was clear to me the moment I heard it how naturally the last two notes had suggested "no cheese."

I have heard the old familiar phrase once in the south of England, but in the Midlands I have noticed both, the second being the more common. I have only once had the opportunity of listening to the yellowhammer in the north of England, and then it sang the first version. In Scotland I have heard both, but the first much more frequently than the second. So I am inclined to think that in northern parts of the country the fashion tends towards the simpler form. This seems to be confirmed by the fact that Mr. Stanley Morris, whose book on *Bird Song* is founded on observations extending over many years in Sussex, makes no mention of what I call the northern version. My experience may be only the result of chance—if I had been a few minutes

earlier or later it might perhaps have been different -but it is sufficiently remarkable to be recorded. Others may care to check my observations by their own, and an accumulation of evidence will show whether my belief is well founded. In any case the interesting fact remains that there are two main forms of the song and that they are varied as I have described. In listening to the song it is well to bear in mind that the high note is so high and so shrill as to be inaudible at a little distance. This may at first cause confusion, in spite of the obvious interval it creates in the southern version.

As the yellowhammer is more or less a stay-at-home, it is possible that other versions are sung in particular districts. The most remarkable variant I have heard was sung at St. Ives, Hunts. The bird was sitting on a heap of stones by the roadside and he repeated many times this phrase:

Presently a bicycle passed and the bird, being slightly startled, paused and changed his position. When he resumed his plaint, he returned to the northern form of the song. I have since heard a yellowhammer at Haywards Heath, Sussex, singing a similar variation, but with the chromatic scale carried right up to the top note of the ordinary southern phrase. These two versions were no doubt individual fancies and their similarity was accidental, but the very fact that they were individual is significant; it is proof that the song is not merely imitative and traditional but that the race is capable of producing originality.

Individual birds not only vary the song of their race each according to his own fancy, but also often break away

from the traditional manner of delivering it. I have seen the skylark carolling on the top of a haystack, among long grass, while sitting on a boulder by the roadside and while hovering six feet above the ground. I have seen the meadow pipit singing from a sprig of gorse, and the tree pipit from the ground and from the lowest wire of a fence. On commons the corn bunting sings from the top of a gorse bush, but in cornfields he is quite content with a small clod of earth. Similarly, on open treeless tracts such as moors, heaths and downs, the cuckoo will often call from the ground. At times the robin will sing from any object lying on the ground. It is not uncommon for the wren to deliver his full song while passing from one perch to another. The goldfinch, the stonechat, the wood warbler, the sedge warbler and the cuckoo frequently do the same, but the sedge warbler makes of it a graceful performance by describing an arc in his passage. I have heard a blackbird sing the whole of one of his most elaborate phrases while he was in flight, and I have records of others such as the willow warbler, the chaffinch and the missel thrush uttering parts of their songs on the wing. But of the many exceptions I have met with, none has impressed me more than the sight of a thrush singing on the ground. This has been my fortune twice. The first time the bird was hopping about and feeding on a grassy common, and apparently he was annoyed by another that was challenging from a tree in the distance, for now and then he paused and almost involuntarily shouted a few notes in reply. But presently he could not contain himself any longer, and flying up with an air of great determination to the top of a neighbouring elm, he sent his answer ringing across the common. On the second occasion the morning was windy and the thrush was sheltering behind a hedge and piping to himself, with

as much vigour and enjoyment as if he had been comfortably seated on his usual lofty perch and calling defiance to a hundred rivals. My surprise, of course, arose from the fact that for years I had been accustomed to see thrushes regularly every morning and every evening throughout the summer, each singing from his own particular seat, which was usually the very top of a fir or a high and prominent branch of some other tree, and I had thus come to think this was an invariable rule.

Though this habit of singing from one favourite platform is most noticeable in thrush and blackbird, it is common to all our singing birds that perch. There may be plenty of similar spots close at hand, but once the bird has made his choice he is not easily induced to change. He may try some of the others at odd times, but when he really feels in a mood for singing, and always at his regular periods, he returns to his favourite. There must be something about it that pleases him and puts him at his ease, and so gives him the feeling that only there he can sing at his best. Sometimes his preference is not easy to understand. One afternoon while I was reading in a cottage garden, my attention was caught by the twittering of a swallow from an ash tree that was only a few yards from my chair. At first I could not see him, but he returned to the tree at intervals in his hawking and I noticed that he always approached it in the same way and with the same wide sweep. Then I found that he invariably alighted on the same little twig, which to me seemed obscure and not any more suitable than dozens of others through which he had to thread to reach it. But of course I did not know his purpose. Perhaps it was that he had caught the knack of taking it in his flight and prided himself on his skill, for after he had sung he always left with what might have

been a continuation of the sweep with which he arrived. Perhaps he liked singing there by himself hidden among the leaves, or perhaps he liked the perch without knowing why but just because he liked it. He had certainly not selected it because it gave him a full view of the nest, for that was on the other side of the cottages; nor because it would in any way affect his mate, for she was well out of earshot; nor because it was an outpost of a territory which he had to defend against all comers, for swallows are sociable and live and feed in flocks.

As I watched him sitting there I was impressed by the richness of the chestnut on his throat, and as he came and went, by the flashing blue of his glossy back. Many of our singing birds are modestly plumed, but the swallow is by no means exceptional among them. I cannot understand the assertion made by certain writers that brightly coloured birds are never good songsters. The following extract from Mr. Pycraft's book on *Bird Life* puts this theory in a nutshell:

"Brilliantly coloured birds or great songsters represent those who have been so successful in the struggle of life that they have something over of their vitality to spend in this way—the luxury of music or fine feathers—but let it be noted, never both."

As it stands, this means that those writers are either deaf or colour blind. Either they have never heard the beautiful song of the goldfinch or, if they have heard it, they have not been aware that the bird which sings it has a gorgeous plumage. This bird has been persecuted for generations by bird fanciers both on account of its fine feathers and of its song. According to the theory it ought to be one of the most successful birds in the world, but it is

not nearly so successful as the common sparrow, which apparently has not enough vitality to spare for either music or bright colours. The chaffinch is a beautiful and handsomely coloured bird and an accomplished singer. So are the redstart, the stonechat, the wheatear, the yellowhammer, the red-backed shrike, the blue tit, the great tit, the swallow, the martin, the pied flycatcher, the pied wagtail and the yellow wagtail. No colour is so brilliant as pure white when it is well contrasted with black. Compare the dull plumage and unmusical screaming of the swift with the swallow's beautiful colours and song. The swift is a most successful bird and is possessed of unbounded vitality, but the struggle for existence through which he has passed has not forced on him either a brilliant plumage or a musical voice. Compare also the magpie and the pied flycatcher. Both are successful and both have evolved the same striking colour scheme, boldly contrasted black and white, but the flycatcher has a beautiful song and the magpie only a harsh chatter. I cannot think of the black plumage and bright orange bill of the blackbird, one of our finest songsters, as anything but a brilliant combination of colours, and the blood-red legs and bill of the redshank are most effective against the pure white of his underparts as they are seen when he is displaying before his mate, yet he has sufficient vitality also to produce a beautiful and haunting song. The robin's breast is not bright red, but it cannot be called modest or inconspicuous, neither can the rosy breast and crest of the linnet. The crests of the goldcrest and firecrest, though tiny, are brilliant gems, and the gorgeous colouring of the pigeon's neck has not prevented him from developing his beautiful, soft, crooning lullaby.

The sparrow and the jackdaw are both dull in colour and both spend a great part of the day in shouting at their

companions. Less expenditure of energy would be required of them if they were to sit still and convert their senselessly reiterated noises into a series of pleasing sounds. The green woodpecker is bounteously endowed with bright colours and his yaffle is a song which could be made as beautiful as the willow warbler's without any increase of cost. I venture to suggest therefore that great songsters among birds, whether modestly or brilliantly plumed, are those that have learnt to control their vocal outbursts and, in addition, have the gift of an ear.

I discuss fully the significance of bird song in the chapter on "Winter Song," but here it is pertinent to say that it is not essentially useful. Much ingenuity has been expended on trying to prove that it is, the necessity for the proof being that if it is not, there is something wrong with the doctrine which asserts that nothing can survive in Nature unless it is utilitarian. But to say that it is, is as good as saying that poetry is useful. Even poetry has on occasion been made to serve materialistic ends, but none the less it exists primarily because it is poetry, and so bird song, though it may perhaps be usefully applied, survives and flourishes because there is something in bird life that is above utility. It may be usefully applied in early spring when the cock birds are taking possession of the territories which they intend to occupy during the season, and while announcing their ownership to all males of their own species within earshot, are endeavouring to attract possible mates to their property. But it must be remembered that birds which have no song are just as able to assert their rights and to secure mates as those that have. So song is not a necessity to any bird, and though it may perhaps serve to arouse female curiosity, we must not assume that it does any more than that.

If the song of birds had been intended originally as an aid to courtship, we should expect it to be at its most brilliant pitch during that fateful period ; but the very opposite is the case. The blackcap, which is considered to be one of our finest songsters, is so excited when he is courting that he squeaks and splutters and rattles out weak imitations of blackbirds and other aliens instead of relying on the beauty of his own superb notes. The yellowhammer in similar circumstances is so nearly inarticulate that the only thing he can say is "jim," and that seems to serve his purpose well enough. The blackbird carries through his courtship in a ditch, not on a tree-top, and the song thrush and missel thrush waste no time on serenading, but instead play a quiet game of hide and seek. As for the poor skylark, he dare not attempt to demonstrate his superiority, for if he did, while he was striving to soar that one foot higher, his lady love might flit off with his rival. So if he sings at all, he does it half-heartedly, fluttering in circles like a common greenfinch and keeping his eye keenly on the earth instead of on heaven.

There is a period when male birds do compete earnestly in song one with another, but that is much later. After some weeks of exciting, strenuous, useful life there comes a time when they know that at last their wives are safely settled on full clutches of eggs, and for the next two or three weeks they have little to do but please themselves. During those busy weeks they have seized every opportunity to practise and to measure the quality of their rivals, and now with their days to themselves and other than useful interests, and with their own powers developed as nearly as possible to perfection, they give themselves over to happiness and fill the air with a glorious flood of useless but beautiful sound.

The fallacy that only usefulness can survive arises out of the fact that animate nature as a whole lives under the shadow of an awful Terror. It is this that causes the majority of mammals to crouch or sleep by day when it is worth while being alive, and to prowl about at night when it is not, and thus compels them to devote their energies entirely to utility pursuits. We ourselves can often escape from the Terror temporarily and even for considerable periods, and we can therefore sometimes afford to be fools, and birds by taking unto themselves wings, are able to escape too and, breathing the spirit of freedom, bless their hearts! they join us in our folly.

And their singing is not merely useless, it is positively dangerous. They sing and flit and dance boldly in the sunlight, as much as to say: "There you are, you old Terror, catch me if you can, and if you can you may eat me." It would not be true to compare it to the glee of a small boy jeering at a policeman from a safe distance; it would be much nearer the truth to liken it to the carelessness of British soldiers playing football within range of enemy guns, in full view of the gunners and under the very imminence of attack. It is not bravery, for most singing birds are timid; it is not indifference, for they are ever quickly alert. It is partly confidence in their wings, in their ability to escape as they have already done, but it is also a revolt against the crushing discipline of existence, an open defiance of the Terror, a healthy, joyous and reckless abandonment to the impulses and interests of the moment. And yet there are people without an ear for music who wonder why it is that bird song always appeals to them, and others with an ear who are proud to declare that they have "become hardened to it."

CHAPTER FOUR

THE PAIRING OF BIRDS

When a bird sings it is pouring out the joy that is bubbling over in its heart, but when it calls we guess that it is saying something. Even if it means only: "Here I am; come and join me," it conveys a thought, a wish and an invitation from one brain to another of the same species. And we can prove that bird calls mean at least this by imitating them and watching the result. Every bird has to be able to say it to its mate and to its young ones, the chicks must be able to say it to their parents, and they must all be able to say it to other families of the same species when they join in flocks for the winter.

The notes of most birds are so high in pitch or are of such a nature that it is almost impossible for us to imitate them, but some of them come well within our compass. It is quite easy to mimic the hoot of the tawny owl, and the bird will answer. I have caused this bird to leave his perch, fly a distance of fifty yards and hover close to my head by an immediate repetition of his own signal, not the hoot

but the other which is usually described as *ke-wick*. I have attracted the curlew, one of the wildest of birds, in a similar way. My most successful experiments, however, have been made with the cuckoo which is very easily gulled. I have been astonished at the accuracy with which this bird tracks a rival. Again and again he has come to the very tree under which I have been challenging, and once when I was well hidden a cuckoo came over the top of a wood and alighted on a branch only a few feet away from me and on a level with my eyes. On that occasion he was a long way off when I first tried to attract him and he came in two stages.

From such experiments you realise how important the call is to birds and how easily, with its aid, they can find each other though they may have no nest to serve as a centre. You also learn that each species has more than one call and that each of these has a meaning of its own. Besides the mating cry there is always an alarm note, and there may also be one of anger and another of distress. The cuckoo has at least two distinct notes which he uses at close quarters. One is somewhat like the sound you make if you blow gently between the leaves of a book twice in quick succession, and the other, which seems to represent anger or alarm, can best be described as *wuh-cuh-cuh-cuh-cuh*, and suggests rather the coughing of an old man than the shout of a cuckoo. This species has still another distinctive call which is commonly referred to, by those who know it, as the bubble note because it resembles the sound made by water when it is being poured from a bottle. It can be imitated closely in miniature by closing the lips tight, then suddenly parting them and closing them again as if you were trying to pronounce the word pup. This should be repeated rapidly thus,

Pup-p-p-p-pup-pup-pup-pup-pup.

Among naturalists this peculiar note is recognised as the call of the female cuckoo. You will very soon get clear evidence that it is so if you make a practice of summoning the cock. I have several times heard it employed apparently by a bird which also uttered *cuckoo*, but in no instance was the evidence strong enough for conviction.

You cannot experiment long with the cuckoo without becoming aware of some other important facts. One is that each bird has his own individual way of expressing the racial notes. When you hear several calling at the same time you will notice that they are not in tune with one another. Most of them will be singing in thirds, that is with the second note two tones lower than the first, but in different keys. Occasionally you will meet with cuckoos which have marked idiosyncrasies. I have known many that have sung on a much lower key than is usual and with a difference of only a single tone between the two syllables, and one that hiccoughed all through the season, his voice breaking thus,

cu-cuckoo, c-cu-cŭck-koo.

This last bird returned to the same place for at least six seasons, and at the spot where I watched him most regularly he used the same perch year after year. That was one of his outposts, and so far as I could gather the others he occupied were also always the same. At any rate, his beat, or the area of his territory, was approximately the same every year.

Each male cuckoo takes possession of a piece of land when he arrives in this country and he stakes it off by calling periodically throughout the day from certain selected perches, which are situated at various points more or less

on the outer margin of the claim or within it. This territory he is prepared to defend against all other males of his own species, and he signals from his outposts to warn them off his property and at the same time to attract lady visitors.

The hen cuckoo also occupies a territory and this does not necessarily coincide with that of a male cuckoo. If it did we should conclude that the cuckoo pairs as other birds do, but the evidence does not justify such a belief. The territory of the hen may overlap that of more than one cock, and the territory of the cock may be intersected at various points by those of more than one hen. My experience satisfies me that the hen cuckoo is a confirmed coquette if not a hardened polyandrist.

Whenever a female cuckoo has a choice of mates, she will go wherever she is likely to attract two or more males rather than where she is certain to secure only one. The following was the first of many similar incidents which happened while I was studying the various notes of the cuckoo.

I hid myself near one of the regular outposts of a certain cuckoo and called him from the next, which was about quarter of a mile away. He came post-haste and we had a lively debate for ten minutes or so. Then I was startled by the bubbling of a female cuckoo close behind me, and immediately my rival crossed the corner of the field and joined company with a hen which had been attracted by our duel. She at once made off at full speed, and he followed in hot chase. As a parting shot, and without expecting or even hoping for any result, I called again, when, to my astonishment, she swept round and came towards my hiding place, and as I called once more, the pair flew past within a few inches of my head, sailed up over the trees and disappeared.

It is etiquette among cuckoos, as among other well-known creatures, that though the female comes in response to the invitation of the male, she must always make a pretence of running away. This hen habitually announced her presence from a certain tree, or from its immediate neighbourhood, whenever she visited that particular corner of that cock's territory. It was situated diagonally across the field from the cock's regular perch and about a hundred yards away from it. It would have been quite easy for her to have gone to his tree, but that would not have been correct. Apparently she must not do anything so outrageous, but must declare herself somewhere in his vicinity and then fly off when he approached. I have noticed a similar custom among other birds.

These cuckoos either roosted in that quarter of their territories or visited it every morning at dawn. When the general chorus of bird song had been in progress for a few minutes after daybreak, the male cuckoo invariably proclaimed his wakefulness from his favourite perch, and frequently he was answered immediately by the hen from hers, so frequently that I was disappointed when she was silent. This may have been coincidence, but I give it as one piece of evidence against my own and the general belief that cuckoos do not pair.

Besides communicating with each other by means of calls, birds can also talk by signs. I first made this discovery one March day while I was watching some lapwings through field-glasses.

During the winter these birds live in large flocks which roam over the low-lying, flat and marshy land near rivers, and along the coast, where they find plenty of suitable food except in the hardest frosts. But in March they scatter over the country again, and the sound of their joyous calling

as they toss and tumble over the fields is one of the surest signs that spring has come. I love to watch and listen to them in those early days, and to feel and share their gladness at the return of sunshine and warmth and life to the world, so when one bitterly cold day I heard their joy-notes, I stopped to welcome them. At first I could see only two and apparently they were fighting, or perhaps it would be more correct to say they were engaged in a tournament, for they never actually came to blows though they made a great show of doing so. They were giving a display of their powers of voice and flight and their skill of wing, each trying to outdo the other. Up they mounted, wheeling and dashing this way and that with a ringing *tcher-weet, tcherr-willooch-willooch-weeet*, then suddenly swooping swiftly and recklessly as if they were going to dash themselves on the ground, sometimes diving in one long curved plunge but more often with a quick zigzag motion, their strong wings cutting the air at each turn with a resounding *whoo-whoo-whoo-whoo.* They seemed to take a delight in trying how close they could go to the earth without touching it, but always just when it seemed as if they must strike their beaks into it and destroy themselves, they swept round, skimmed the surface for a yard or so, then bounded up with another wild call to wheel and plunge again. It was impossible for me to say which was the more skilful, but as I followed them with my eyes, I heard another note. It was not the glad *tcher-weet* that they were shouting, but a prolonged *pease* which is the lapwing's ordinary winter call. So I guessed that other eyes and ears more capable than mine were watching and listening, and passing judgment on their voices and movements, and after scanning the field carefully once or twice, I spied another lapwing, presumably a hen, standing alone about the middle. This

accounted for the contest and for the excellence of the display, which was the finest I had ever seen. She was evidently encouraging them and waiting to see which would be the victor.

Now, though I could not see any difference in their skill, one of the competitors was evidently a stronger bird than the other. Probably he was older and more experienced. In any case he ever and anon attacked his rival, spoiling his plunges and gradually forcing him away to the far side of the field. In these bouts the birds came very close together, and, flapping fiercely, mounted up and up as if each were trying to get above the other, but never once so far as I could see did they strike with wing, beak or claw. Nevertheless, in this way the one I took to be the younger was made to feel the other's superiority, and at last he settled in the farthest corner of the field. Once or twice he rose again and the contest began afresh, but finally he admitted defeat by remaining quietly on the ground. The victor flew jauntily round the field several times, in the manner of an old-time knight in the lists, to show that he was master, and there was boastfulness in the long, strong, booming beats of his wings and in the tone of his voice as he shouted defiance to his defeated enemy. Then, having proved in this way to the watching lady lapwing that his prowess was no longer challenged, he alighted.

I expected that he would take possession of her at once, but to my surprise he chose a spot at some distance from her. It is a common practice among birds, however, when they are approaching their nest, to drop a little way off and run towards it in order to keep the secret, and I thought, therefore, he intended to do this. But when I picked him out again he showed no signs of advancing; instead, he presently did what I thought was so wonderful.

Apparently even among birds it is one thing to be a conqueror and quite another to win a wife. The hen had seen and no doubt admired his splendid display, but still she had to be wooed, and this is how he did it. He sat down in the manner of a barndoor fowl snuggling over her eggs, and then he moved his body from side to side as if he were making a hollow in the ground. The lapwing's nest is a shallow dimple with a few straws roughly crossing one another to line it. This then is how that dimple is formed, though many may be shaped before the hen chooses one for her nest. In the present instance the cock was only acting in dumb show. He could not say to the hen : "Come, let's make a nest and have a family of chicks," but he had to pass that idea from his brain to hers, or at any rate, to stir within her the emotions which would arouse her nesting instinct, and he did so by suggesting that she should do a definite thing and implying that he was prepared to help her. The hen showed that she was interested and seemed to understand, for she turned and took two or three little runs towards him. Then, either from shyness or coyness, she suddenly sprang into the air and flew away over the trees that surrounded the field, with quick excited wing-beats as unlike as possible the long steady strokes of the lapwing, her whole action suggesting the thrill of a great joy rather than a sudden fit of fear. The victor followed in close chase, and the defeated hero remained behind on the ground in the far corner of the field. So, though I was not privileged to witness the end of the story, I have no doubt that when they came to earth again they were mated.

During March and all through the nesting season you may observe other birds acting in a similar way. For example, I once saw a whitethroat suggesting to his mate that they must really start building a nest. He first attracted

my attention by calling her with the usual harsh note of the species, *charrr*. For a time she remained hidden in some bushes, and while she did there was nothing unusual in his manner, but when at last she appeared he became greatly excited. He hovered down before her with his tail spread and the feathers of his crest slightly raised and with his head and his white throat turned towards her and his eyes flashing love and entreaty, he sang to her with the greatest fervour. She was thus wooed with the full power of his personal beauty, with the rapture of his song in its most brilliant and most passionate mood, with the rhythmic spell of his slow, undulating wing-beats, and with the grace of his posture and of his gentle, almost imperceptible progress, all at one and the same time. The whole display was a wonderful hover dance inspired by an ardour so intense that you would have thought it must have softened the hardest of feminine hearts, but it seemed to make little impression on her. Presently, as she maintained her air of indifference, he picked up a short piece of dried grass and carried it, calling appealingly the while, in among some low gorse, where he made a great show of placing it in position. This he repeated twice, taking his material each time to the same spot; but though the hen was curious enough to alight on the gorse and inspect the site from a distance, she gave him no encouragement, but instead, as if in sudden panic, flew off. Calling anxiously, he followed in hot chase, no doubt to repeat his courtship until at last he induced her to make up her mind. For though it is the male who chooses and defends the territory, it is the female that selects the nesting site. The one to which he tried to attract his mate was a stupid place for a nest; for it was within six inches of a path and not concealed. It was probably not seriously intended as such, but merely chosen

on the spur of the moment for the purpose of demonstrating what he wanted her to understand.

This, and especially the cock's love display, is the prettiest sight I have seen in my whole study of bird life, and, strange to tell, the two were so deeply absorbed in their own affairs that they acted the incident within two yards of me, though I was standing full in the open.

It has long been assumed by people who have not taken the trouble to study the phenomena carefully, that the hen bird selects her mate, and that all the splendid plumages and all the wonderful songs of the cocks are due to her fine sense of colour and her perfect ear for music. The two incidents I have just described are examples of many I have witnessed all of which are strong evidence against such a theory. The three lapwings were in a field which was at a considerable distance from the nesting ground of the flock and was surrounded by trees. Apparently the hen, finding that she had two suitors, had characteristically led them a dance, and there in that isolated field the cocks had equally characteristically decided the matter between them. The two whitethroats were already paired and the cock was anxiously trying to persuade his mate to settle down to the serious business of the season. In other words, they were engaged and he was endeavouring to induce her to name the day. They had agreed to occupy the same territory, but a hen may do this and make no further progress for a week or more. During that period the cock sings and displays to her; that means that he makes love to her as a man does to his fiancée, and among birds some of the manifestations of love-making are more frequent and often more brilliant after than before marriage. In a large number of cases mating is accomplished so quickly and so simply that we must conclude either that there has been love at first sight,

or that an old pair have come together again after a long separation. But whenever there is any question of rivalry the cocks fight it out and the hen marries the victor.

Rivalry might be much more serious among cock birds but for the great law of territories. In accordance with this, at the approach of spring the male birds of many species which may have spent the winter in bachelor bands or, in the case of migrants, have pushed on in advance of the hens, scatter throughout the country, and each seizes a piece of ground containing suitable nesting sites and providing an ample supply of food, and he advertises his ownership by singing and displaying from certain points of vantage. This is his territory, and all the wealth of it is his, and he is a prince, but when a beggar maid enters it he marries her without more ado, or if she be coy, he pays court to her so ardently that he keeps her within his bounds till she consents. This means that, among such species, whatever the cock's individual qualities may be of plumage or of song, he cannot hope to secure a mate unless he is a man of property. The hen, so to speak, comes and inspects his bank account before she will consent to marriage.

It has therefore been assumed that the holding of territories has been forced on those species by the limits of their food supply. This may be true, and on the face of it it seems to be true. The land is capable of supporting only a limited number of any one species and if the birds were to multiply beyond that number, some of them would have to starve or find new sources of food. In such circumstances it would be imperative for the cocks to parcel out the country into holdings, which would be large enough to support a pair of adults and their family until the youngsters were able to take care of themselves. But this theory has not been proved, and it is open to question.

I used to know a large garden in which several pairs of thrushes nested and there the food supply was never in dispute. What aroused animosity in a male early in the season, was the approach of one of the others to that portion of the shrubbery which later became the hiding place of his nest. After nesting operations had begun, and indeed at all times, the birds fed indiscriminately and without any sign of rivalry, on the lawn and in the kitchen-garden. Thrushes from neighbouring gardens could also help themselves without question to the good things that were to be found there. Further, in winter when food is scarce, birds are friendly and sociable, and live on the principle of sharing such supplies as are available. In summer food for all kinds of bird is superabundant. Between April and August it multiplies far more rapidly than the birds themselves. It must do so, for, being organic, it has to survive the ravages of winter in sufficient numbers to renew itself next spring and at the same time to support the largest possible number of birds. We have no evidence that any species has ever been reduced to a state of famine through over-multiplication in the height of summer, except perhaps in abnormal circumstances. Long before they can reach such a predicament other destructive forces come into operation. The starvation theory is a fallacy that has been developed by the common tendency to argue from particular phenomena instead of from a broad general view of Nature as a whole. What we do know is that when some of these destructive forces are controlled, species tend to increase in numbers, and that when they are not, the increase at the end of the summer is so slight, in spite of the great army of young birds hatched and fledged, that the ravages of winter reduce the total of nesting pairs to approximately what it was at the beginning of the previous

spring. We also know that when a species is decimated by a long and bitter winter, it will multiply quickly for several years until it has recovered its former numbers and, after that, will do no more than hold its own. But that average does not represent the total number of pairs that are capable of rearing families in the height of summer. In so far as it relates to the food supply at all, it represents the highest number of individuals able to survive the winter. So it has no bearing on the question of territories, unless we can prove that the territories capable of supporting a pair of birds and a family of chicks number the same as the pairs that can live through the winter.

The cuckoo's territory does not seem to be limited by his food supply but by the outposts he is able to defend effectively, and he holds it because by doing so he possesses a piece of country in which he can meet and court females of his own species without interference. Birds that nest in holes, such as the tits, the nuthatch, the redstart and so on, have to go where such sites are to be found, and as these are scattered, the various pairs must separate. Among such birds competition for a site more frequently arises between different species than between two pairs of one species.

A nest is placed in a hole in order to keep it out of sight and reach of inquisitive or hostile strangers. Birds that make elaborate nests and are unable to build them in inaccessible positions, have still greater cause for secrecy, so one reason for holding territory would be that a male would secure a mate most readily if he were in possession of land on which a nest could be successfully and conveniently hidden. A second would be that as there is plenty of food for all in summer there is no need to crowd, and a third that nests scattered up and down the country would be more likely to escape detection and destruction than the

same number gathered together in a colony. Once the males were dispersed, their jealousy would increase because the nesting ground that each had selected, if effectively held, would become a sanctuary in which, by various artifices, a cock could hope to keep a hen visitor engaged without interruption for long enough to court and win her.

Many people believe that bird song has been evolved as a means of holding the territory; that this is the useful service by which it "survives." But the territory can be held by an ordinary call. The greenfinch knows this, and, though he has a distinctive song, he does not trust to it for practical purposes. He seems to sing for his own amusement, but ever mindful of the important duty of defence, he frequently interrupts his refrain by interjecting his harsh *breeze* call. The beautiful, plaintive *tway* of the wood warbler carries as far as his trilling song if not farther, and the chaffinch need never trouble about a song so long as he can shout *pink*, nor the wren so long as he can wind up his clock. The robin's call is far more arresting and challenging than his song, and so are those of most birds, for example, the harsh notes of the nightingale, the whitethroat, and the hedge sparrow. The lesser whitethroat has developed a call into a song by repeating the single note *zwee* rapidly several times, but he also sings a sweet warble of many notes which is so soft that it can be of no value for defensive purposes. If the red-backed shrike were commoner than he is, his song would be useless for the serious business of holding territory, and the same is true of the spotted flycatcher. On the other hand, the swallow and the house martin, which live together peaceably in colonies and are never troubled with the problem of territory, sing all day long either from a perch or while flitting about in the sun.

The idea that song "survives" because it saves the time

of the hen when she is seeking a mate, is untenable, for there is nothing in the notes to indicate whether the cock is already married or not. If a hen enters the territory of a married couple, the cock will make no objection to her presence, but she will be dealt with summarily by the hen already in possession, though there are many instances of two hens laying eggs in one nest. Thus she will be passed on till she meets an eligible bachelor. She will then marry after a show of indifference, unless he should happen to have a neighbour who is also single, in which case there will be a duel.

I saw such a duel the other day, which is quite common in spring and can be witnessed by anybody. Three birds flashed across the road in front of me, and then from the hedge came a great confusion of screeching and fluttering. At first I thought it was simply an everyday sparrow fight, but when I drew near I saw two cock robins in the lower part of the hedge sitting with the tips of their bills only half an inch apart, and glaring fiercely and shrieking the wildest things at each other. They may have been calling each other thieves and scoundrels or merely shouting: "'Tis," "'Tisn't," but they looked as if they were ready to tear each other to pieces. After a little one of them got tired of it or began to fear that his opponent would carry out his threats, and he flew off in a great hurry. The other followed him to make quite sure that he had gone, then returned and went away in company with the hen, which all the time had sat calmly in the hedge above them and watched the contest. She may have preferred him, but whether she did or not, she could not afford to accept the one that was beaten.

Most bird fights end like this before they really start, and of those that do begin very few last beyond a few

vicious pecks. Some, however, are so fierce that they end in the death of one or the other of the combatants or both. The usual practice is to strike hard with the beak on the top of the opponent's head, and in order to get into position to do this the two birds sometimes flutter up several feet into the air, each trying to rise above the other. It may be that one such blow well placed is sufficient to make a bird "see stars," but in any case the weaker, or the younger and more inexperienced bird, usually admits defeat before he is seriously hurt.

I once witnessed the opposite, several hens fighting for the possession of one cock. They were chaffinches. I believe the cock already had a mate and the other hens were intruders, but he showed no sign of any preference. The hen, which I guessed was his wife, was fiercely trying to drive the others away. It was early in the season and the only other cock chaffinches I saw anywhere near the party were still living in flocks.

Whenever possible a hen bird will have more than one suitor, as I have already shown. But this does not mean that she intends to choose. She is never allowed that privilege. It is largely coquetry, and implies rather that she is incapable of deciding and wishes the choice to be made for her. At any rate, that is what actually happens. There is no need to multiply instances. They are common in spring and can be easily studied by any interested observer. But whereas among cuckoos such incidents occur every day throughout the season, among more orthodox birds they may happen only once for each pair at the beginning of each season or perhaps only once in their lifetime.

Either before or after, or both before and after the fighting, or at any time prior to the laying of the eggs even if there has been no duelling or rivalry of any sort,

the cock makes his love display, and this varies according to the species. The exquisite performance of the whitethroat which I have described earlier in this chapter is a good example.

Most people on a spring day have seen their own particular robin twisting himself into strange attitudes in the presence of one or perhaps two others and have concluded that he was lovesick. They have done so because they have seen him alone all winter, and have assumed that his companion which had appeared "in springtime, the only pretty ring-time" must be a hen. The robin, however, is a most disconcerting bird. According to the rules which have been so carefully worked out by biologists for his "survival," his race ought to have become extinct ages ago. For if there is one fact in bird life which has been proved beyond question by sound and uncompromising scientific investigation, it is that the cock robin is not concerned about marriage. He is not a lover at all, and has no wish to have a mate. His dominant desire is to be left alone. To this end he owns an estate which he is prepared to defend with his life against all comers of his species, female as well as male, and his contortions are therefore not an expression of lovesickness but the equivalent of "squaring up" or any form of threat employed by a man who finds a trespasser in his garden. He is one of those unfortunate, "hopeless" or selfish creatures who become so absorbed in their own private interests that they are not only incapable of practising the important art of wooing, but actually fail to notice or to be affected by the charm of the opposite sex. Indeed, he has been saved from the awful doom that has been pronounced on him by biology, solely by what may seem to be the abandoned, but is really the heroic and almost tragic behaviour of the hen.

She, poor thing, is one of those bold hussies who have adopted male characteristics to demonstrate their independence. She has acquired the red breast, which is a serious danger to herself and therefore to her offspring, because every male she may meet will recognise it as a challenge to battle. She also holds an estate of her own and actually sings in it, which we are assured amounts to no more and no less than shouting to her rivals, "Go and boil your head," though as might be expected, she says this very sweetly and politely. But one day she wakes up to the horrid realisation that not only her rival hens but also all the desirable cocks are telling *her* to go and boil her head, and that in fact she is not wanted.

Thenceforth her male impersonation is hateful to her. She cannot get rid of the dangerous red rag, but she stops being nasty to her neighbours and, leaving her property to any one who may care to take it, she crosses the border and enters the domain of a fierce and pugnacious cock. She has trespassed frequently before though always hitherto she has fled in headlong haste the moment the owner has shown himself, but now inspired by the courage of desperation, she flies to his favourite bush and in effect plucks his beard. He squares up at once and, posing and protesting loudly in song like an operatic star, tries to work himself up to fighting pitch. If she were to retreat now he would pursue and attack her. The incredible effrontery of her action, however, has so taken him aback that at length his "go and boil your head" sticks in his throat and as she stolidly stands her ground, he gradually cools down and allows her to stop. This is the scene that is so often witnessed and misunderstood. It is the climax but not the end of the drama. For weeks thereafter the cock ignores her, and she has the good sense to show no umbrage at his

rudeness, and above all to keep her mouth shut, for rivalry in song in his own territory might be fatal to her. She may, it is true, and from time to time does, utter the strident alarm note, which somehow suggests "go and boil your head" more cogently than the sweet and fluent song and can be heard at least as far away (is it possible that the interpretation has been attached to the wrong phrases?), and thereby she co-operates in the defence. Eventually, however, she builds a nest without his aid or encouragement, and then, and not till then, he knows that the game is up and acknowledges that for one more season he is utterly married.

Nevertheless other birds assume peculiar attitudes when engaged in making love. The cock chaffinch stands in front of the hen with his wings half open so that she may get a good view of his rosy breast, his blue cap and his white wing bars. The goldfinch sits in a similar fashion, but sways from side to side so that the beautiful broad golden bars on his wings flash alternately in the sun. The willow warbler has a curious display. He sits on a twig in full view of the hen, though not necessarily before her, and, crouching low, flaps his wings slowly; this he will do for more than a minute at a stretch. Once while I was resting, I watched a willow warbler repeating this performance at short intervals during the greater part of an hour. Unfortunately it did not occur to me to time him, but I am certain that some of his flappings lasted for several minutes. The action is so like that of a hen sparrow that, when I observed it first, I jumped to the conclusion that I had seen a hen willow warbler wooing a cock; but afterwards I discovered that when these birds are mated they will sometimes both flap wings while sitting side by side on the same twig, or on neighbouring twigs. The yellowhammer and

the reed bunting erect the crest obviously for the purpose of showing it off, and so do several of the warblers including the blackcap, but he also raises and lowers his tail and ruffles the feathers on his back. Tame pigeons and the rock dove, from which they are all descended, distend the breast and bow and coo. This has never struck me as an attractive manœuvre; there is something in the tone and action that suggests an attempt to bully the hen into submission. I have never seen the wood pigeon try to domineer over the object of his affection. When he bows he lowers his head submissively to the ground and keeps it there for a moment or two. His object may be to show his back and tail which are necessarily tilted up at a sharp angle, but his whole action suggests vividly the prostration of a slave before his mistress. In addition to this, however, he has a much more interesting display of his own. He follows the hen about for some time from branch to branch and from tree to tree, and when she still evades him he suddenly springs up perpendicularly into the air, and mounts with quick wing-beats about twenty or thirty feet, then as suddenly turns and glides down in a gentle curve, with tail spread and half-open wings, to a perch close to his lady love. There is so much grace in this movement that it must make a strong appeal in itself, but at the same time the poise of the bird as he descends is such as to give the hen a full exhibition of his whole upper plumage, except perhaps the back of the head, and especially of the large white patches on his wings which are so conspicuous a feature when he is in flight.

Ducks and grebes have much more elaborate displays involving the performance of several separate and distinct measures. These can often be witnessed during the winter on ponds or other sheets of water where flocks of duck are wont to feed.

From such a display as that of the willow warbler some of the dances performed by birds may have been evolved. For example, the chiff-chaff instead of flapping on a perch, flies from one perch to another with a peculiar slow action of the wings. The wood warbler does a similar thing but frequently sings the while, and the greenfinch has carried the same idea further and given the dance definite form by describing a circle and returning to his perch.

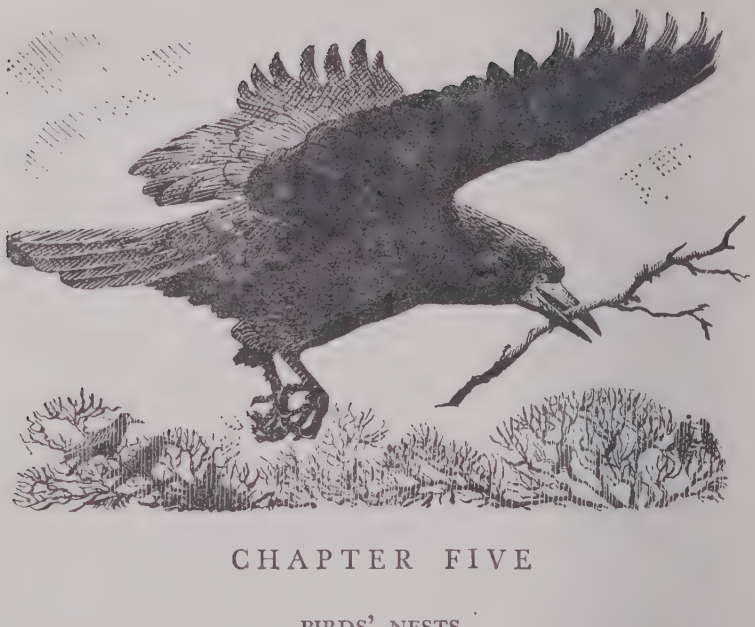
After the mating is satisfactorily settled, another kind of demonstration sometimes takes place. I was first told of this by a little girl, but the idea was so human, or anthropomorphic as the scientists express it when they wish to warn us against the sin of jumping to other than materialistic conclusions, that I felt she must be wrong. One day, however, I was watching a tree creeper and noting with pleasure that he was not working according to the books, when I saw him leave his tree and, instead of descending to begin on another, fly up to the next with a good deal more spirit than usual in his flight. This was soon explained, for I found that he had alighted beside his mate and, with a show of affection, was presenting her with something, no doubt some special tit-bit he had just found. The two then worked together on the same tree for a little and he repeated the favour twice. As luck would have it, that same morning I saw another similar incident. An excited pair of marsh tits came racing towards me, and if I had not moved, would have alighted on my head. Instead, they dropped to the ground close by, and the cock then picked up something and with an appearance of tenderness presented it to the hen, which took it with all the demureness of a girl giving and receiving her first kiss. It is charming to think that this was the equivalent of a betrothal. At any rate it apparently took place at the end of the love chase,

and thereafter the two birds flitted about and fed as a pair. Such gifts are frequently offered in the course of their courtship by the males of several species but are rejected with the utmost frigidity, so when at last a hen accepts one, it is a sign of her consent, and the act is therefore a mutual plighting of troth. It means in fact that the male undertakes to feed the female while she is brooding, and no doubt at the same time it arouses the maternal instinct within her. Curiously enough, in accepting the gift she acts the part of a helpless youngster. This you may see if you watch the robins in your own garden at mating time.

I have said that the fighting may take place only once in the career of a particular pair of birds, for it is generally believed that birds pair for life, and incidents are common that seem to prove this. We all know examples of a pair of birds nesting in or near the same spot year after year, and we like to think it is always the same pair. When we consider, however, the dangers that lurk in the path of every bird or may overtake it in its journeying, we may well wonder whether it can be. When we remember also that in many species the sexes part for the winter and gather in separate flocks, which either migrate or wander far and wide through the country in search of food, it may seem impossible to us that a particular pair can ever come together again. But it has been proved by putting rings on the legs of nestlings that birds can return to the same spot year after year, though they may in the interval have travelled as far as South Africa and back. So it may be the original pair that nests again and again in the same hole or tree or garden or patch of wood or field, but if one of them should meet with an accident the other may bring a new mate the following year, and this bird may in some future season be forced to find another partner, and so on;

or it may be that in some winter both parents are destroyed and in the spring one of the previous year's nestlings takes over the site and carries on the tale.

It is therefore important to record any incident that proves constancy in a pair of birds. I had the good fortune to observe one on an August morning during the Great War. I had to mount guard on a rocky point, and not being able to sleep, I broke the monotony of the intervals between the changing of the sentries by going out from the wooden guard hut to look at the stars and later to watch the sun rise. As the grey light of dawn began to spread, I heard the familiar call of a curlew and saw the bird coming round the point. When it passed me repeating its call again and and again, I wondered at the peculiar note of inquiry in its voice, which reminded me very much of the manner in which we shout to somebody we wish to find but whose exact whereabouts is unknown to us. It proceeded up the east side of the point and was soon out of sight, but a few moments later I heard its call change completely. Instead of the two questioning notes *wha-up*, it became an excited *too-too*, *too-too*, *too-too*. There was no suggestion of alarm or fear in it, but a true ring of joy as if it had discovered a whole Klondike of worms round the bend. Presently it returned with a companion which was clearly the sole cause of its pleasure, for they flew close together round the point and across to the other side of the bay, one of them calling joyously *too-too*, *too-too*, *too-too* all the way. I could only conclude that they were either about to pair, which was unlikely at that season, or that they were a pair, had nested together somewhere on the moors in the spring, still found pleasure in each other's company, and would nest again the following spring at the same place if both survived.



CHAPTER FIVE

BIRDS' NESTS

If you happen to live near a rookery you cannot help knowing when March has come, for, at the beginning of that month the rooks become fussy and noisy over the choosing and building of their nests. Year after year the old nests are used again, and if the birds that owned them last year have not survived the winter, others will seize them. Then there are quarrels and fights, for more than one new couple are sure to want each free nest. It may be that they are lazy about building new nests, or that they know that the old nests are on the best and safest sites (which is very likely, because founders of the colony would be careful to choose the most suitable forks for their cradles), or that they feel that it is important to win the homes of their great ancestors. But, in any case, the pos-

session of the old nests is always settled before any new ones are begun. Sometimes a pair will pull an old nest to pieces and build another in its place. Presumably they have found that the winter storms have so loosened the structure that it would be a waste of time to repair it, or at any rate that it would be safer to rebuild it. That they are able to reach such a conclusion suggests that they can apply reason to the solution of a problem and communicate their ideas on the subject, one to another. They have not only to decide to rebuild, but also to agree not to adopt the simpler plan of constructing a new nest on a fresh site.

Most birds do their nest-building quietly and as secretly as possible. But the rooks cannot hide theirs, so they talk about them freely. Every time they come back with a twig they shout the news to the whole rookery and to any one else who may be able to understand them. But it is dangerous for them to boast too much about a stick, for it may be stolen by a neighbour when they are gone to fetch another.

The winter storms bring down many twigs and the rooks make use of these. But if twigs are scarce and the wind does not happen to be obliging, the rooks will break some from the trees themselves. This saves the time spent in searching and fetching ; but it means more than that. There may be plenty of twigs on the ground, but they may not all be suitable and it will cost time and trouble to make a selection from them, whereas it is easy to go to a whole tree-top of them and choose those that will best serve the purpose. But further, the twigs on the ground are mostly old and dry, while those on the trees are strong and lithe and so well fitted for weaving.

I have noticed this done chiefly when the birds are beginning new nests, and it has occurred to me that they use these young, straight, and unbranched shoots specially for

building the foundations, as they may be so readily twisted about the branches of the fork. Later, when a stout base has been formed in this way, sticks from the ground may be brought and built up on it to complete the nest.

It has been said by some observers that the rooks always break twigs from trees some little distance away from the one in which they are building, and certainly if there is a lime tree within easy reach they will take what they want from it, for the shoots of the lime are long and withy. I have myself, however, watched a rook taking material for its nest from the elm in which it was adding one more home to an old colony. It simply sailed round to the other side of the tree, broke off a twig, carried it to the fork chosen for the nest, placed it in position, and then returned for another, and this it repeated several times within a few minutes.

I was able to observe its action through field-glasses, and I noticed that it grasped the shoot close to the branch with its beak and wrenched it off, as we do, by bending it sharply from side to side. Each time it stood over its task, but sometimes a rook will seize a twig from below and add its weight and the leverage of its flapping wings to the powerful jerking of its neck.

The rook is not the first of our birds to nest—the raven begins in February and so does the crossbill—but, apart from exceptional blackbirds and thrushes, it is the earliest of those we all know well. A few follow suit as March advances, but the majority wait until April or May. While this busy season is in progress observers cannot fail to be impressed by the wide divergences in the habits of the various species, even of those that are closely related.

Some birds make no nest and are none the less prosperous for the omission. The guillemot lays her single egg

on a bare, windswept ledge of barren rock. Her cousin the razorbill seeks shelter in a crevice or cranny of the cliff, but still makes no better provision for the egg. A third member of the same family, the puffin, which in other respects lives a similar life, has advanced much farther in her nesting habits. She usurps a rabbit's burrow in the turf at the top of the cliff, or, failing that, digs one for herself. Usually the egg is deposited on the bare floor of the tunnel, but sometimes the bird makes a rough bed of seaweed, grass and perhaps some feathers.

On sandy or shingly beaches the ringed plover and the lesser tern lay their eggs in a slight hollow such as a bird can make quite simply by side to side movements of the body. No grass or other soft lining is added, not even on the hard shingle, but the ringed plover sometimes lines her scrape with small pebbles or shells. The common tern, which lays her eggs in similar situations, also places them in a hollow on the bare ground, and sometimes adds a lining of dried grass. The various gulls nest on the ground or on ledges of rock and make nests. The amount of material they use varies; sometimes it is scanty and sometimes plentiful, but occasionally there is none.

In the fields the lapwing, peewit or green plover as it is variously called, and on the moors the golden plover, nest on the ground, making a slight hollow with the body and lining it with a few pieces of dried grass or straws. The redshank, which belongs to another branch of the same family, forms a similar nest but often places it in the middle of a tuft of grass and draws the tops of the blades together to screen it.

The rock dove builds a flat bed of sticks, seaweed and coarse grass on a ledge of rock. The stock dove nests in holes, which may be in cliffs or in old trees, or may be

deserted rabbit burrows. Sometimes she uses no nesting material, and when she does collect a little, it is very roughly put together. The wood pigeon builds a platform of sticks on the branch of a tree. There is no design or ingenuity in it. The sticks are laid across one another just as the straws are placed in the lining of a lapwing's nest, and sometimes the structure is so flimsy that it is possible to look through it from the ground and see the white eggs resting on it.

In the woods the nightjar lays her eggs on the ground without even making an attempt to form a hollow that would hold them. Her distant cousin, the tawny or wood owl, lives in a hollow tree and deposits her eggs on the bare floor of her home. The woodpecker chisels a hole in a tree and from this drives down a perpendicular shaft to a depth of eighteen inches or so, at the foot of which she hollows out a room large enough to accommodate herself and her chicks. But having done all this, she prepares no soft bed for her eggs.

The nuthatch, the starling, most of the tits, the redstart and the wheatear, which also rear their families in holes, use the recess for shelter only and build inside it a cosy nest each after her own heart. The sand martin nests in a burrow which she digs in the side of a sand pit or cliff, and into which she carries a great quantity of straw and feathers. Her cousins, the swallow and the house martin, build mud receptacles for their nests of straw and feathers, each in a style of her own. The swallow's design is a shallow saucer which she places on a rafter or a similar support; the house martin's is a hollow hemisphere with an opening in one side, and it is attached under the eaves to the perpendicular side of a house without any support but the adhesiveness of the dried mud.

The skylark and the pipits make neat cups of grass on the ground and usually place them where they are sheltered by some overhanging tuft of grass. The willow warbler, the chiff-chaff and the wood warbler likewise form cup-like nests on the ground, but shelter them artistically by building a dome over them. Our other warblers are content with the simple cup.

The cup is the ideal form for a nest that is built in bush or tree. It is not a necessity, as we can see by the flimsy stick platforms of the wood pigeon and the turtle dove, which hatch their eggs and rear their young safely and successfully without the aid and comfort of a retaining wall, but having been once designed, it has been carried to a wonderful pitch of perfection by some species and it has enabled rook, reed warbler, and many more to occupy sites which would otherwise have been untenable. It is probably more advantageous to birds which employ straw, moss and similar soft substances than to those that use sticks. I know a wood in which rooks and herons nest on neighbouring trees, and the herons are just as successful with their flat stick platforms as the rooks with their elaborate deep baskets.

Sticks are the chief building material used by the larger birds that nest in trees. The jackdaw, which nests in holes, either in cliffs or on buildings, also uses sticks. This is probably a sign that formerly he built in trees, which he sometimes does still. A clear proof of this development is that, in spite of his undoubted intelligence in other matters, he has not yet mastered the art of carrying such intractable material into a narrow hole. Every spring the ground at the foot of church towers, in which jackdaws make their home, is littered with sticks. These are not thrown out by birds in the course of spring cleaning; they are fresh units

brought for the new season's nest. But as the jackdaw carries a stick by the middle in the manner of the rooks, it brings him to a sudden halt when he reaches the narrow entrance, and after two or three vain attempts to push it through, he drops it and, with much excited chattering, goes off to fetch another.

The nuthatch, which nests in holes with an entrance only large enough for the passage of her body, has been faced with the same difficulty and has solved it. She builds with strips of bark. Many of these are three or four inches in length, but she carries them by one end and is thus able to take them into the hole without difficulty. This bird usually occupies a hole of considerable dimensions, but reduces the entrance to the requisite size by building in it a wall of mud.

The common sparrow shows more intelligence than the jackdaw in adapting herself to new nesting habits. She makes at least three different types of nest according to the site she chooses. She often builds in trees, and when she does this her nest is quite different from the untidy heap she puts together when she makes a home under the eaves. It is certainly not neat, but it is a ball of hay or straw lined with feathers, and has a secret entrance. The explanation of this difference is to be found in the bird's popular name, house sparrow. That, of course, suggests that the bird is in the habit of nesting on houses; but when our ancestors lived in caves or in tents there were no house sparrows. The hay ball which the common sparrow builds in trees is therefore most probably the original form of the nest, and since the bird has learnt to use the ready-made shelter of eaves, she has become more slovenly in her work. In such positions it is not necessary to weave a firm fabric to support the eggs, the brooding mother and the growing chicks,

Jackdaws Nest Building.

nor to thatch a roof to protect them, so the sparrow sensibly saves herself this trouble, and simply piles up a loose bundle of straw with a hollow in the middle of it which she lines with feathers to make a soft and warm bed for the eggs and youngsters. When she invades the farmyard stacks she does even less than this. She finds in the stack a huge ready-made nest, so she simply presses down the hay or straw into a cup and lines this with feathers. When all the best of these sites are already taken and a pair are forced to resort to a tree, they return to the original form of the nest which their ancestors invented for that purpose long before ours had begun to think of houses. The willow warbler and the wood warbler also sometimes nest under cover, for example, in a hollow under a stone or in a hole in a wall. When they do so they omit the usual dome.

Thrush, missel thrush and blackbird all build nests of one type. It is just a large cup constructed of dried grass and roughly lined with mud. Inside this the blackbird and missel thrush add a further lining of dried grass. The song thrush is not only content with the mud lining, but she finishes it off as smoothly and neatly as an expert potter would do it. There can be no doubt that this solid inner wall makes a very warm if not cosy and comfortable nest for herself and her family, but the continual wonder is that it should be a suitable and successful bed for the eggs. Often instead of mud she makes a paste of dead wood or other similar material, and individuality is shown by numbers of all three species in the choice of building materials. Moss is often, and bracken sometimes, used as a substitute for dried grass, and pieces of paper, cotton, string and other scraps are frequently introduced into the structure. This variation is deeply interesting, when we consider the wide difference there is between dried grass and moss and the

special treatment each must require to convert it into a firm, well-knit wall.

A thrush's or a blackbird's nest is readily seen, even in a thick hedge, because of its size and shape, and because it is just a nest and no more, but a chaffinch's is almost as easily missed, partly because of its smaller size, but much more because of the skilful way in which it is arranged in some fork of tree or bush, and because of the wise choice of the stuff of which it is built.

At first sight it seems to be just a thickening of the wood in the fork and this impression is strengthened by the manner in which the outside of the nest is finished. It is a very neat little nest, made chiefly of moss closely felted together, and cosily lined with feathers and horsehair. Other things are also worked into it—for example, wool and cobwebs—but generally the outer coating of the nest is dry green moss, and on most trees this harmonises so well with the bark, which is often either mossy or tinged with green, that it seems to be just a part of the branch or branches on which it is placed.

But on birch trees and in woods, where the stems and branches are whitened by an overgrowth of lichens, the plain moss would be noticeable as a dark patch against the light bark, so there the chaffinch decorates the outside of her nest with little strips of lichen, which, like the camouflage on a ship or a gun, help to deceive the eye of a passing enemy.

You may think that this is just chance, that the lichen happens to be there and the chaffinch uses it because it is handy. But I have found a chaffinch's nest in a thick hazel hedge surrounding a wood where light grey lichen was plentiful, and yet not a scrap of it had been used in the building. The nest was so well hidden by the broad plentiful

leaves that there was no need even for neatness, and the birds had apparently understood this, for they had made a large, loose structure of moss, with very little lining, and so thin that I was surprised that the eggs had not dropped through it. Moreover, it was not fitted carefully into a fork, but was placed flat and almost carelessly on a horizontal branch and supported by two spreading twigs. If I had not seen the birds and the eggs I could never have believed that it was a chaffinch's nest.

But look at the robin's nest. Often you may find it in an old kettle or biscuit tin, in a flower pot, in a letter-box, or even in an old hat. Indeed, you may induce a pair to nest in your garden if you place some such thing in a convenient position in the hedge or among the ivy some weeks before the nesting season begins, so that the birds may become used to it. But wherever you may find the nest you will notice that it is built of moss, roots, dry grass and dead leaves, and also that though it is neat and cosy inside, it is untidy outside.

This untidiness and those dead leaves do not help to hide the nest when it is placed inside a tin can or an old hat, but the robin's favourite site away from gardens and farmyards and their tempting novelties, is a hole in a bank. This she fills up with a rough and seemingly careless heap of moss, roots, and dead leaves, and at the top, and snuggling in among these things, she makes her nest. Anywhere else such a heap might seem unnatural, but here it is just like dozens of others all along the bank that have been blown together by the winds of autumn and winter. Here, again, you may think the robin uses these materials because they happen to be the most handy she can find, but if that were the case, why should she use the same materials when she builds inside a greenhouse or a toolshed ?

The truth is, that, like the chaffinch, long ago the robin was taught by sad experience that there are many egg thieves about, and in order to hide her home from them she found that it was wise to choose materials from her surroundings, and gradually she learnt to put these together in such a fashion as to seem quite natural. A neat round nest of dry grass or straw might be easily seen in such a position, but her careless heap of moss and leaves may be passed at quite close quarters without being noticed. This became her instinct, and she has found no cause to depart from it when she is making use of tin cans and other modern inventions. Even here her untidiness is probably more protection to her than neatness would be, for her nest may be readily taken for just a handful or so of rubbish that has been blown in by the wind.

The conventional explanation of this design is that it has been brought about by the destruction of all robins that have done otherwise, but we have no proof of this and we have strong evidence to the contrary. For, if all birds were wiped out that omitted the rubbish heap, why is the yellowhammer so common ? She nests in similar situations to those most natural to the robin, that is on banks and under hedges, and she makes no elaborate camouflage of dead leaves, but is content with such protection as her simple cup of dried grass receives from overhanging herbage or bush, yet her race lives and flourishes.

The wren goes a stage further than the robin, for though she chooses a great variety of sites, she always selects a building material to match her surroundings. Very often she uses moss, but where that would be incongruous, she employs grass or leaves or bracken, and where necessary decorates the outside with lichen. I have seen a wren's nest composed entirely of lichen. This wonderful nest never

varies in design. Wherever it may be placed and of whatever substance it may be constructed, its invariable shape is a globe with a round entrance in one side. Unlike the sparrow, the wren never omits the dome even when she builds under the perfect shelter of an overhanging bank or root, but these sites are only occasional, not universal and hereditary like the eaves and stacks frequented by the sparrow.

In appearance the nests of the goldcrest and the reed warbler are just of the ordinary cup-shaped type, but from an engineering point of view the ideas involved in their construction are revolutionary. Birds' nests have been evolved from the natural hollow formed in the ground by the body of the brooding bird. This in time was lined with grass or other material, and when birds sought greater safety in trees they formed their nests of what would otherwise have been the lining. Consequently the vast majority of nests are begun at the bottom, the first units being laid on the fork or whatever other support may have been chosen as the foundation. For the reed warbler wishing to build on the reeds among which she finds her living, this aboriginal method is impossible, for there no such support exists.

The bird has a choice of three methods. She might build a floating nest, or she might construct a platform between three or four reeds and on that erect her nest in the usual way. But she chose to hang her nest up among the reeds, which means that she must begin at the top and work downwards instead of starting at the bottom and building upwards. Accordingly she first weaves a strong upper structure round three or four of the smooth upright stems. She may find support in the angle of a leaf here and there, but this is not essential, for the outward pull and slant of the reeds is sufficient to prevent slipping. From this she

weaves downward and inward until she completes the rounded bottom of the basket. It is unlikely that this wonderful structure was the result of a sudden inspiration; probably it had its stages like other things. The marsh warbler builds a similar nest and usually places it among meadow-sweet, willowherb or any rough herbage, where it finds more support than among reeds. The sedge warbler chooses the same kind of situations and gives her nest a deep foundation of woven grass which raises it above the ground, sometimes eighteen inches or two feet. If this foundation were removed the nest would be suspended, and as a matter of fact the birds do sometimes omit it. The whitethroat, though she does not suspend her nest, usually begins to build it at the top. The reed warbler probably began as the whitethroat or the sedge warbler has done, and having made considerable progress, passed through the marsh warbler stage and finally achieved perfection among the reeds.

The cup of the reed warbler's nest is unusually deep, and it is assumed that this has been brought about by a process of selection, those that built the usual shallow cup, having failed to rear their broods, while those that by chance constructed a somewhat deeper receptacle were more successful and so on. But if a bird has sufficient originality to develop a new principle of construction—a feat which could be accomplished among our own enlightened selves only by the exercise of the greatest courage, determination and perseverance in face of the fiercest opposition—surely it will have enough left to deepen its cup when it has found from experience that this is necessary. We have no right to assume that when a bird is building a nest she has no conception of what she is doing (which is the ultimate assumption of the conventional theory) or that she is incapable of

bringing judgment to bear on her work, or of finding out for herself the margin of safety and acting accordingly, even though we must admit that, like a certain proportion of human beings, some birds are fools.

The goldcrest had to solve an entirely different problem, how to hang her nest under the branch of a fir tree, and she has done it by a skilful use of spiders' webs. The whole fabric consists of moss and lichen bound together by cobwebs, and sometimes the needles of the supporting twigs are woven into the rim, but more often in my experience the cup is swung on short ropes composed of matted or twisted cobwebs and strengthened, or at any rate covered with moss. The use of spiders' webs is not new; it is with these that chaffinches and many other small birds felt their mossy walls together; but what is novel is the employment of it as the sole support of the whole nest and the consequent transference of the strain from the bottom to the top. But the most astonishing part of it all is that, not content with this degree of originality, these feathered mites, with the inspiration, courage and impulse of genius, have flung to the winds all the accumulated routine of ages, and have adopted an entirely fresh and boldly revolutionary building method of their own invention. According to one trustworthy observer, Miss E. L. Turner, the first stage of their work is the construction of a complete framework of cobweb, which suggests that the girder principle of building is not as modern as we believe it is.

But what are we to think of the extraordinary nest of the long-tailed tit ? In appearance this is somewhat like a large stout sausage or marrow set up on end and with a round entrance hole in one side near the top. It is usually built of moss or lichen, but sometimes of other material, for example, wool, and it is placed in a hedge or in a bush.

All the other tits nest in holes, and it has always been a matter for wonder that the long-tailed tit differs from them so strikingly. There has therefore been some speculation as to the origin of her nest, and the one most commonly accepted is that the whole remarkable structure has been designed with a view to hiding her tail. When she is sitting in her nest, however, the bird turns her tail up over her back, and if she were to do this in an open nest the effect would be so unbirdlike as to afford her perfect protection.

Mr. E. Selous, a naturalist of great experience and uncommon insight, once watched a pair of long-tailed tits building their nest from beginning to end, and he expressed the opinion that the shape of the nest was due to the unbounded and blind enthusiasm of the birds which, having constructed a nest of a reasonable size and form, could not stop, but must go on building up and up "aided by Natural Selection," but in what way he does not explain, till at last the wails by their own sheer weight bent over and they could build no further. And the entrance he believed existed not because they wanted such a thing, or thought they ought to have one, but because, as they always worked from the inside, they could not complete the structure without building themselves in.

The truth, I am sure, is much more interesting and lies much deeper than either of these ideas suggests. All our tits are descended from a common ancestor that nested in holes. Those holes were no doubt in trees, as walls, letter-boxes, flower-pots, kettles, bottles, etc., were not invented then. Holes in trees were then, as now, limited in number, and all those that were suitable for nesting would consequently be occupied by the stronger or more pugnacious species. One branch of the tit family, therefore, being weaker or less aggressive than the rest, found itself

constantly driven from these comfortable quarters and compelled to nest in the open. They knew perfectly well what a nest ought to be. Their instinct of that period, if not their experience, told them it was in the first place a deep well with a firm bottom on which they might place a bed for their eggs and chicks, more or less circular walls, a roof, and high up on one side an entrance. Having fixed on some kind of suitable site for the nest they built the foundation. But it was their instinct to bring a large quantity of moss and to felt it together closely, as is still done by their hole-nesting cousins, and besides, there ought to be high walls and a roof and an entrance near the top. So they brought their usual quantity of moss and wool and cobwebs, but instead of piling it in a great heap they built themselves the orthodox walls and roof and left the entrance open at its proper place. In short, they made a model of a hole in a tree, working it out in moss, just as our own forefathers, finding forest glades scarce in certain parts of the world, notably Salisbury Plain, and being therefore without temples, constructed glades for themselves of stone and so took the first step in the evolution of the cathedral. Whether the tits afterwards added the lichen for decoration, or because that was the kind of thing to have on the outside of a tree, and by thus making the whole thing more realistic gained protection for their home, or because they definitely chose the material as likely to deceive possible enemies, or whether it has survived only as the fittest of many variations and been developed in a series of minute increases, is a matter for speculation. When it is placed high on a tree, as it sometimes is, it is difficult to see, but in a hedge or a bush, which are its most common sites nowadays, it is one of the most obvious of all nests, so we may presume that while it was being evolved it was built most frequently on

trees. But in any case, considered as a model of a hole in a tree (and when you once look at it in this way other explanations of it seem impossible), the structure is infinitely more interesting than as the domed or bottle-shaped nest of the bird books, or as the accidental outcome of the surplus building energy of two very active birds. The nest is no longer just a nest, and the bird becomes something more than a bird. She is an artist capable of reproducing in a very intractable medium something which she has observed or which, like many human artists, she derives from her inner consciousness. That the individual is not responsible for the design, does not detract in any way from the accomplishment. The idea may be part of the bird's racial memory, but each works it out in her own way and no two nests are alike.

In addition we have to think of the method of construction and the workmanship. The walls seem to be solid. They are built of a thick, closely packed felt composed of many thousands of pieces of moss, wool and cobwebs. These are brought usually one at a time, placed in position by the bird's beak and pressed downwards by its chin, and as it grows, the structure is moulded by a circular movement of the bird's body accompanied by an outward punching of the breast and pressure of the wings. When it is completed it is lined with feathers, over two thousand of which have been counted in one nest.

But whatever the truth may be in regard to the design of the nest, there can be no question as to the meaning of the most remarkable feature of the whole structure. There are thousands of feathers inside the nest and, as they form a cosy bed for the eggs and the young, they are of practical value to the species. On the outside of the nest there is only one feather and it is always there though it has no practical

value. It is placed near the edge of the entrance, and is so arranged that we cannot avoid the conclusion that it is intentionally displayed. This is a piece of pure decoration. It serves no useful purpose and never has done ; the birds could rear their young just as successfully without it. So, according to the scientists, it is an impossibility. But there it is nevertheless on every nest, not always in the same position but placed according to the taste of the builders. It is comparable to the carving on a Gothic doorway or to trimming on a woman's hat. Its sole value is that it pleases the eye of the owners. It is the finishing touch which they give to their work of art. Its audacity suggests that it is the work of the male; perhaps some day we may be able to discover whether it is or no.

Another example of the æsthetic treatment of a nest is to be found in a quarter where it might be least expected. Among our birds of prey the peregrine falcon, the kestrel and the hobby build no nest. The peregrine and the kestrel scrape a hollow in the soil on the edge of a cliff. The kestrel also make use of the old nests of other birds such as crow or magpie, and this is the invariable habit of the hobby. The sparrow hawk does this also, but utilises the old nest only as a foundation and builds her own on the top of it. Other species, for example, the common buzzard and the golden eagle, make elaborate structures. The eagle shows a preference for the great wood rush as a lining, but the buzzard decorates the interior of her nest with green leaves, which must be frequently renewed, for they are always fresh. Presumably the bouquet is brought by the male, but we have no definite proof of this.

The amount of work done by the male varies considerably in the different species, and even within certain families, and probably it varies also among individuals.

Both sexes of long-tailed tit carry out the work of building, and so far as one can judge they seem to be equally enthusiastic and interested in what they are doing. This is by no means the rule among other species. In the majority of cases the cock does nothing. He may attend his mate and watch her movements, or he may even make a show of helping, but if he does carry some of the pieces, he gives them to his mate when he reaches the nest. Sometimes he may be permitted to place one in position, but when he does so the hen nearly always readjusts it. There can be no doubt, of course, that this is the hen's special sphere, and she knows it and sometimes insists on it with a show of temper, as much as to say: "For goodness' sake go away, you clumsy duffer!" which some of us have heard in human establishments. But this is her one opportunity, her only chance of expressing herself except as a mother. Her husband can let himself go in extravagant plumage or in a joyous outburst of song, but throughout her life she has to suppress herself for the benefit of others. Even in this matter of nest building she has to exercise the greatest care lest her work should be conspicuous or what we call vulgar; in other words she must temper her enthusiasm with taste, and any decorative effects she may allow herself must be done as far as possible in low tones. But any one who has ever watched a hen bird building her nest must agree with me that for the time being she is transfigured. She is absorbed in her work, work, that is, in the human sense. She is not merely picking up her living; she is giving herself to something that is above and beyond mere existence, and it makes a new creature of her.

It is now that the modest little hen chaffinch comes into her own. During the greater part of the year she is hardly noticeable compared with her gaily coloured, high-spirited

mate, and she goes and comes so soberly that if she is observed at all it is only while she is feeding in the middle of the road. But when she begins to build her nest she changes completely. She becomes full of life and activity, and moves about with the air of having something important to do and knowing how to do it. Her head is held ever on the alert and her tiny eyes seem to sparkle with interest as she devotes her energy and ability to completing her little masterpiece and bringing it to perfection in every detail.

I have not been able to view the whole process of the building of a chaffinch's nest, but I have spent hours watching a hen at her work. She first attracted my attention by a most unexpected performance. I caught sight of a bird some distance away hovering *under* a branch of an oak tree and apparently trying to snatch something from the bark. I had never seen a bird do such a thing before, and I could hardly believe my eyes when I drew near and discovered that it was a hen chaffinch. She flew off as I approached, but a minute or two later she returned to the same tree and began a close search of the branches. Her method was to hop along the top, but at every third or fourth hop to go over the side and, clinging there, reach downward and inspect the under part of the branch. This was so unexpected and so tit-like that I examined her again more carefully through my glasses to make quite sure of her species, and as I did so she suddenly dropped, hovered under the branch as before, and after two or three attempts, she seemed to get what she wanted and flew away. This time I followed her flight and discovered her secret; she was building a nest in a fork of a neighbouring tree. Unfortunately the site was too high for me to see what she did when she got there, so I had to content myself with watching her movements as she hunted for material.

She returned several times to the branches of the oak, and at first I thought that she must be gathering lichen, but I soon realised that she had not yet reached that stage. For presently she was disappointed, and instead of going to the next tree, she flew straight to a neighbouring cottage and, while clinging to the wall with her feet and supporting herself with a great fluttering of her wings, took something from behind a water-pipe and returned to her nest. Again she came to the oak, but instead of searching among the branches, she settled on the trunk like a tree-creeper and dragged something out from the crevices of the bark. It was therefore not lichen she was collecting to decorate her nest, but spiders' webs or cocoons with which to bind it together. I could see that she had a considerable quantity of moss already on the nesting site, and now she was engaged on shaping this to her mind and interweaving it with spiders' webs to keep it in position.

With short intervals for feeding she was busy with this work constantly all the time I was there, about two hours, and when I left she was still at it. What her mate was doing meanwhile I cannot say. He put in an appearance only once as if to learn how she was getting on, but he made no attempt to help her. Possibly he lent a hand in the early morning with the rough job of collecting moss, but could not be trusted with the more delicate work. This, however, would have to be proved by observation.

Both sexes of rook, jackdaw, starling, swallow and martin take part in the work, and of course we all know that the cock sparrow, which is a cousin of the chaffinch, does his full share. The cock wren is as skilful a builder as his mate, and he is even said to construct supernumerary nests on his own account. This may be true, but I have never been able to prove to my own satisfaction that these

uncompleted nests are entirely the work of the cock nor that they are supernumerary. My impression has always been that they were experimental and were abandoned either because the hen was not prepared to lay, or because she was dissatisfied with the site or preferred another, or because she felt that she could make a better job if she began again, or most probable of all, because she had a difference of opinion with her very positive mate as to the disposition of a particular piece of moss. Where two are concerned in the erection of such an elaborate structure disputes are almost bound to arise, and if he interfered with something she had done, or what is more likely, if he insisted on replacing some little bit of his own which she had altered, she would lose interest in the place. For surely the nest is hers, not his, and if she cannot have her own way about it, what is the use of having a nest at all ? I put little faith in the suggestion that the cock builds these empty shells either for amusement or as a shelter for himself. The affection he shows for them probably indicates that they contain some pet idea of his own which his mate, quite absurdly, will not accept. It is true that if the completed nest comes to grief, or if she decides to rear a second brood, the hen may return to one of those empty shells and may even condescend to finish and use it, in which case the cock's satisfaction is intense and, when all is said and done, quite understandable. If, however, these are actually cocks' nests, they are not supernumerary but preliminary, suggestions as it were to his mate that it is time to begin, just as the male whitethroat may persuasively place a few pieces of grass before the eyes of his mate, or may even build a considerable portion of a nest in anticipation of her coming, though she almost invariably rejects it when she does.

The natural desire of the hen bird to have her own way

in the making of her nest, which is often emphatically insisted upon by the robin and other species, may account for much of the indifference of the cocks, and the question arises whether these birds are only learning to build and may in time become as expert as their mates, or have already almost lost the power and impulse, and others from the same cause are gradually tending in the same direction. The wide differences in the customs of the various species are shown by the facts that while in some the cocks give no help whatever, in others they timidly offer their services; in some, for example, the skylark, they fetch most of the stuff though the hen does all the construction; in others again they do their full share of the work, and in one extraordinary case, the rare bearded tit, the cock not only carries out a considerable part of the building but usually adds the whole of the lining. Is it possible that, while there are undoubtedly graces in the courtship of birds, there is a tendency among some to develop chivalry in this practical form ?

But in any case, why does a bird line her nest at all ? We cannot explain this on the conventional principle that a lining was necessary and therefore was evolved by the elimination of all birds that failed to add one to the nest, for the wood pigeon never lines her nest and nevertheless, in spite of the combined effort of the best gunners and trappers of a sporting nation and the demands of egg and skin collectors, is increasing at an alarming rate. Neither can we dismiss this bird as the exception that proves the rule, for woodpeckers, owls, wrynecks, swifts, nightjars, plovers, sandpipers and terns manage to do without linings and some of them even dispense with nests. These birds demonstrate that it is possible to flourish and even to multiply without such luxuries, and when we remember

the draughtiness of the wood pigeon's open-work platform, we may be tempted to conclude that a Spartan upbringing is the one most likely to ensure a bird's success.

The lining, therefore, is not indispensable, but even if it were, why should a bird choose a special and a finer material for this purpose ? When a nest is built of grass, for example, why should it be lined with finer grass ? The song thrush flourishes on a lining of mud or dead wood. The blackbird also lines her nest with mud, but, not content with that, she adds an inner lining of grass, yet she is not any more prosperous than her cousin. There is not a wide difference between a rook and a carrion crow, yet if you were to find a solitary rook's nest and a carrion crow's on neighbouring trees, you could at once tell which was which by the lining. The rook's nest is lined with rootlet's and the crow's with rabbit's fur. The pied wagtail and the grey wagtail are more closely alike in habits, but the former lines her nest with a variety of substances, whereas the latter for the same purpose uses only hair, and seems to have a preference for white hair. The whinchat, which is a summer migrant, lines usually with fine grasses, but her close relative the stonechat, which seems to be a hardier species, or at any rate is hardy enough to spend the winter with us, very often permits herself such luxuries as feathers, hair, wool or down. The willow warbler and the wood warbler are so much alike that the average observer cannot tell the difference between them till he hears the song of the male. They are both summer migrants, both live on the insects they find on trees, and both build domed nests of moss and place them in similar situations. The willow warbler provides herself with a thick quilt of feathers, but there is never a feather in a wood warbler's nest except when she is there herself or when her young are fledged.

How can these differences be explained by the conventional theory? If all the willow warblers that failed to use feathers have been exterminated, why have the wood warblers been allowed to exist? Are all those stonechats that use only grass for lining, being slowly weeded out and those that employ feathers and other luxuries mounting to prosperity on their carcases? If so, must we expect presently a special concentration of skin collectors to hasten and complete the extinction of the already doomed whinchat? Is it the coloured or the white-lining variety of grey wagtail that is gradually vanishing from the face of the earth? If an inner lining of grass is essential to the existence of the blackbird, why is its absence not fatal to her near relative and close competitor the song thrush? And why is it that the wilder, more savage carrion crow has varied towards luxury, whereas her social and almost civilised cousin the rook has won success in the struggle for existence only by strict adherence to severity?

The truth is that the choice of linings, however it may be passed on from one generation to another—whether by racial memory or by the early recollections of the young hens, which may be presumed to have as startlingly quick an eye for domestic detail as a little girl—is not a matter of success or failure, life or death to any species and cannot therefore have been affected by a law which operates only where success means life and failure means death. The lining itself is simply one of the amenities of bird life, and the choice of the particular material employed depends on the bird's individual taste. The explanation of it is probably not much different from the answer to the question: "Why does man upholster his furniture?" or "Why does he plaster and paper the walls of his room?" It is not surprising to find, therefore, that the builder reserves for this

interesting though unessential part of her work her highest and most delicate skill. She may be a builder, but she is also an artist, and this is her opportunity to give a finishing touch to her masterpiece. The lining of the rook's nest is not just a heap of roots dropped into the centre of a stick platform and then hollowed out by the bird's body. Each piece is placed in position and interwoven with others, so that the whole forms a neat inner shell to the deep cup skilfully constructed of sticks. The mud is not crudely plastered inside a thrush's nest as it is inside a blackbird's. The blackbird knows that she will finish her work with a lining of dry grass so she lays her mud on roughly, as a human builder does the mortar on the inner walls of his house, which he knows will be covered up. The thrush treats hers with as much care as if she were preparing it for distemper. She applies it with her beak, then smooths it by pressing it downward and outward with her body, and by continually turning, brushes it with her feathers till every trace of the tool work has been removed, and it has the appearance of having been moulded in one piece or modelled by the thumb of a potter. And so it is with the majority of the species. Whatever substance she may use, the love and pride of the worker are lavished on this part of her work.

If we can say this definitely of the lining of nests, which though unessential seems to be passed on from one generation to another by what is called instinct, even to the choice of particular stuffs, surely we can say it also of the main structure both as regards its composition and its form, though these may be considered to come well within the scope of the supposed universal law of the scientists.

Some species have advanced still further and have learnt to treat the exterior of the nest with as much care as the

interior. The chaffinch does not always decorate the outside of her nest with lichen, but when she does she applies it with consummate skill. The long-tailed tit invariably employs lichen and with equal skill but not always with equal effect. As I have already suggested, this nest may have originated among lichen-covered trees, and the change to hedge and bush may be so recent that Nature has not had time to convert the species from the instinctive use of an unsuitable cover. But it may be that the bird, in spite of the obvious handicap, uses the lichen because she fancies it.

The ringed plover is said to line her nest with pebbles and shells. What she really does is to arrange these objects so as to form a decorative border round the nest on the side she faces while she is brooding. This border is of no value except in so far as it pleases the artist ; it is actually a danger to the nest, for the circular design attracts attention.

CHAPTER SIX

BIRDS' NESTS: THE EGGS

BIRDS that nest on the ground have their own ways of safeguarding their treasures. Skylarks hide theirs under a tuft of grass, willow warblers theirs among a low tangle of brambles or gorse.

Many species, however, simply lay their eggs on the ground in a little cup, with sometimes only a few crossed straws to serve as a bed for them. These birds are more liable to be robbed than those that build under cover.

A few species have learnt to conceal their eggs when they are not brooding. Ducks, for example, lay eggs that are almost white. The shells may be tinged with cream or blue or green, but these tints are so pale that to all intents and purposes the eggs are white. The nest is usually protected to some extent by the herbage among which it is placed, but

even so, a wild duck will frequently draw some of the nesting material over her eggs when she leaves them. Grebes lay white eggs on floating platforms built of dead water-weeds. These nests are usually screened on all sides by reeds but they are open to the sky, so the eggs, if exposed, would be easily seen by any marauder that might fly above them. But when a grebe is about to slip from her eggs she invariably shrouds them with damp weeds from the sides of her nest by a few quick movements of her bill. To the casual observer the nest then has the appearance of an accidental accumulation of rubbish. When the bird returns she carefully removes the covering before she snuggles down on the eggs.

The lapwing's nest has no covering, and the eggs are large and lie there in the open field ready for any one to pick up who may find them. Yet they have a protection of their own, for whether on grass or on a ploughed field, a lapwing's nest is difficult to see unless you are an experienced hunter. It is so nearly invisible that you may tread on it and destroy the eggs before you discover it. The reason, of course, is the colouring of the eggs. If they were white like a pigeon's or blue like the hedge sparrow's or the thrush's, none of them would ever be hatched, but they vary in ground colour from khaki to greenish and are heavily blotched with dark brown. Khaki is used for the field uniforms of soldiers because it is difficult to see at a distance, and the blotching is just a natural camouflage. So, by using khaki and camouflage, lapwings and other ground birds save their eggs from many a thief.

This colouring of birds' eggs is one of the great problems of natural history, and I cannot find that any of the scientists has given a satisfactory explanation of it. One of the greatest of them, Alfred Russell Wallace, in dealing with

the subject says: "There seems no difficulty in accounting for the facts by individual variability and the action of natural selection," but when he tries to do this he gets into serious trouble. He points out that as the shell of the egg is composed chiefly of carbonate of lime its original colour is white, and he draws attention to the fact that the eggs of owls, woodpeckers, kingfishers, and other hole-nesting species are white, and says that this is to be expected as it is not a disadvantage for these eggs to be white. But when the great law of variation becomes inconvenient we cannot get rid of it by simply popping it into a hole. As this is a universal law, it must act more freely in a hole where it is not subject to selection than in the open where it is. This he recognises four paragraphs later when he says: "The wonderful range of colour and marking in the eggs of the guillemot may be imputed to the inaccessible rocks on which it breeds, giving it complete protection from enemies. Thus the pale or bluish ground colour of the eggs of its allies, the auks and puffins, has become intensified and blotched and spotted in the most marvellous variety of patterns, owing to their being no selective agency to prevent individual variation having full sway." But if colour varies so riotously on an inaccessible rock, it ought to act equally wildly in an inaccessible hole. I have never heard, however, of the existence of colour varieties of owls', kingfishers' or woodpeckers' eggs, nor for that matter of wood pigeons'. What has become of all the creams, or pale blues or pale pinks, not to mention the deeper tints that might be expected to have arisen from the immunity these eggs have enjoyed from selection? We cannot presume that, having laid a clutch of pink or blue eggs, the outraged mother incontinently smashed them or virtuously refused to hatch them. After millions of years of complete freedom

it would not be surprising, on the principle of selection, if we were to find that every individual woodpecker had a colour scheme of her own.

In discussing blue eggs Wallace says: "When we cannot see the meaning of the colour, we may suppose that it has been protective in some ancestral form, and, not being hurtful, has persisted under changed conditions which render the protection needless." *We may suppose!* He does not add, as he might have done, that, in spite of her sex, we must *not* suppose that the bird which lays the egg has, or ever has had, any interest in the matter whatsoever. Mr. A. Landsborough Thomson, the eminent ornithologist, repeats Wallace's idea in a modified but more mischievous form. He does not "suppose" that the blue was protective in past ages; he asserts that it is protective at present on account of "the green foliage" among which the eggs are found. In view of his position we may assume that this is the verdict of our leading scientists and that, science being what it is declared to be, they have formulated it after carefully weighing and considering the facts. We have good cause for surprise therefore when we discover that in the British Isles at any rate, there is not an atom of evidence to support it. Mr. Thomson does not inform us when we may see the miracle of foliage sprouting on the Pinnacle Rocks and other barren abodes of the guillemot which lays bright blue eggs. That is another of the things which we are allowed to "suppose." We may also suppose apparently that when a stoat, a weasel, a snake, a squirrel, a rat, a mouse or a magpie puts its head over the edge of a thrush's nest, it cannot see the blue eggs against the lining of dried mud because of the green foliage on the outside of the bush. (The magpie and other egg-stealing birds find nests not by accidentally flying immediately over them but by observing

the movements of the owners, hence the extreme caution of nesting birds. But in any case white eggs lying under a canopy of leaves would be protected by that covering whatever its colour, and also by its shadow, not to mention the shadow of the nest wall.) Further, we may suppose that when a couple of crows come along in March to harry a rookery as they sometimes do, they fail to see the blue eggs in the nests of sticks and rootlets because of the green foliage that will be on the trees at the end of April; and again we may suppose that, where starling and redstart build, the trees, and where pied flycatcher and wheatear nest, the stone walls and old mother earth herself have a bad habit of sprouting inside. All these birds lay blue eggs, and in not one instance is the colour protective. Those of them that are laid in holes would be protectively coloured if they were black, and light brown would be a protective colouring for the eggs of thrush and rook. It should be added that birds which nest among green grass lay eggs of any colour but blue or green, and only a limited number of the species which nest in green-leaved bushes produce blue eggs.

There are other possible explanations of white eggs. The birds that lay them, having failed to produce coloured eggs, may have been driven, in order to save the race from extinction, to seek the shelter of holes or to acquire the cautious habit of duck and dabchick, of covering their eggs with leaves or other material when they leave the nest. Or, nesting in holes being an older method than nest building, these birds may survive only because of the protection this habit affords them, and they would quickly become extinct if they were to abandon it owing to their incapacity to lay coloured eggs, unless they adopted some other habit that would give them sufficient protection. Another is that

these eggs are white because if they were any other colour, they would be smashed either by accident or carelessness; but this assumes that whenever a tendency has arisen to vary towards blue, cream or pink, it has been at once eliminated in either of these ways, and it does not account for the absence of variation in the white eggs of wood pigeon and other birds that do not nest in holes. Besides, the eggs of the starling, which nests in holes, are pale blue but they have a definite tendency to vary towards white, and there is no evidence that this is due to the infertility or the destruction of the bluer varieties. The egg of the puffin, which nests in burrows, is very faintly marked with blotches, and the probability is that these are vestiges of more obvious markings which were characteristic of the egg when in former ages it was laid in the open.

My own belief is that the colouring of birds' eggs had in its origin nothing whatever to do with utility. It is primarily a matter of temperament just as is the painting of pictures. I can see hands raised in horror at such an idea, but I have never been able to understand why, in all our discussions and inquiries regarding the lower animals, we invariably begin by assuming that they have no interest whatever in their own lives or possessions, but are merely so many spinning tops set going and entirely controlled by fate, or just so much mechanical mud actuated by something akin to electricity and moulded by the freakish thumb of circumstance. I do not suggest that if we were to give a hedge sparrow hands she would forthwith proceed to paint seascapes or fields of cornflowers or even only vases of violets, but I do believe that, without any loss of dignity or any wounding of our own *amour propre*, we may admit that she has a simple and sound taste for a very charming shade of blue.

It must be remembered that in most cases the colouring matter is not part of the shell's composition. It has not been produced by selected changes in the varying substance of the eggshell, but is an entirely new and separate acquisition, a thing which, if there were still only white eggs, we should all declare to be impossible, a thing which, if there had been none but white eggs four hundred years ago, a man might have been burned at the stake for impiously prophesying. The shell is white and the colours are usually washed upon its outside surface in one or more coats, and whether the result is useful or not, the effect is always beautiful. In other words, the bird paints her egg with her oviduct as the artist paints his canvas with his hands.

I see no reason to doubt that this new thing arose from the same artistic impulse as the wonderful colour schemes of plumage. This impulse, being in most cases arbitrarily subdued in the hen bird, finds expression in secret in the decoration of her treasures, very much as a man's passion for colour, which is smothered in the open, runs riot on his pyjamas. The colouring of the eggs was not originated for the purpose of protection any more than was the colouring of feathers, but having been acquired, it has in a large number of species been developed and utilised to deceive possible thieves, and this process may have been helped and hastened by the trimming of natural selection. It is easy, however, to overrate the effects of this negative force. It is quite possible, for example, that not a single lapwing ever lost an egg through its agency, that, in short, the general colour scheme of this egg was worked out so as to be sufficiently protective before the birds ventured to nest in the open. Indeed, if the birds had begun by laying white eggs in the unprotected situations which they now favour, the whole race would have become extinct in a

generation, or at any rate before the first cream shade could have been produced, and even if that had appeared just when it was wanted, it would not have saved them from an average egg stealer. The probability is that the common ancestor of the plovers and the seagulls nested originally in large communities as the gulls do still, and the colour scheme was evolved then under the protection of numbers. How it was accomplished is a mystery, but no doubt the primary cause of egg colouring is intimately related to that of plumage colouring whatever that may have been. The birds may have been frequently robbed by egg thieves and may have had a hard struggle to rear their young. On the other hand, they may have had only occasional losses, but suffered serious and continuous apprehension. Either would have been sufficient to stimulate the nerve centres controlling the colouring process. There is reason to believe, however, that this bird nested on inaccessible rocks where its powers of colour production had free play like the guillemot's. The guillemot's egg is pear-shaped, and the accepted explanation of this is that eggs of any other shape would, and did, invariably roll off the bare rock ledges on which they were laid, and their unfortunate owners would thus fail to produce offspring. If we accept that theory, we may find in it also the explanation of the lapwing's egg which is similar in shape. It is the common belief that the lapwing's egg has its peculiar form because it enables the bird to arrange her eggs in the smallest possible space. Such economy is an advantage, and consequently it is claimed as one more proof of the powers of natural selection. But how could it be ? It could not be selected by natural selection unless it were vital, that is, unless the laying of other shapes meant the inevitable extinction of the layer or her line, and there is no evidence that this has happened. It is

not happening now among the many species of this large and interesting family, though the advantageous pear-shape frequently crops up in their nests. This departure from the typical form of their eggs might be passed by as simply a casual variation, which in the face of disaster, such as must be presumed to have evolved the lapwing's egg, might save the last remnants of the race and so triumphantly survive. But it assumes the utmost significance when we learn that zoologists are agreed that these birds and the guillemot (the guillemot which nests on inaccessible rocks and lays pear-shaped eggs which she seems to be able to colour as she pleases), however much they may differ now in outward appearance, are all descended from one common ancestor. If, then, the inaccessible rock was the scene of its origin, the colour scheme would develop at its own sweet will and without the kindly intervention of the club. And when it was evolved, enterprising branches of the family would be able to venture inland and colonise the land, which would be either unoccupied or feebly held by a wretched, persecuted race that could lay none but white eggs. At first they would settle in more or less open colonies as the lapwing does to this day, and afterwards more venturesome species such as golden plover, curlew and snipe would scatter in separate pairs.

Again, in order to explain the blue eggs of the crow family, thrush, blackbird, hedge sparrow, wheatear, pied flycatcher, redstart and others, it is not necessary to assume that conditions were such in former ages that this colour was protective and that it persists now because it is not harmful, which of course would be contrary to the law that useless things cannot survive. Nor is it worth while to force ourselves against the evidence of our senses to believe that it is protective in its present surroundings; we

have only to look into a thrush's or a hedge sparrow's nest, as stoat, weasel and magpie do, to see that it isn't. All these birds nest in circumstances that are in themselves sufficiently protective, and consequently they can have eggs of whatever colour they like, and they have chosen various shades of blue.

But before we commit ourselves to this belief that birds are interested in the colours of their own eggs and have even some say in the choice of those colours, surely we must first dispose of the obvious objection that they may be deceived by anything in the shape of an egg no matter what colour it may be. A starling has been known to hatch a hen's egg which had been substituted for her own full clutch, but there is the everyday evidence of the cuckoo's egg. If the cuckoo's victim has any interest whatever in her own eggs, or is even able to recognise them, why does she not throw the parasite egg from her nest ? It is larger than her own and quite often is not the least like them. One answer is that when a bird has laid her eggs, her whole nature is consumed by a single passion, and that is to brood. But that is not a full answer, because as often as not the cuckoo's egg is deposited in the nest before the victim has completed her clutch. Another is that birds cannot count. But there is no proof of this, whereas the cuckoo herself contradicts it. She has gone beyond the simple act of summing and has found the answer to the problem, what is left if you add one to any given number and subtract one from the total ? When she places one of her eggs in a nest she almost invariably abstracts one of the owner's, which suggests that she assumes her victim can count. But even if we take for granted that a bird can count her own eggs though she may be unable to count anything else, none the less, the cuckoo's egg is a remarkable confirmation of the

theory I have suggested. For what do we find ? As we have already admitted, the cuckoo's victim does not reject the cuckoo's egg. However unlike her own it may be, she neither smashes it nor throws it out. She is either not aware that it is in her nest, or she accepts it in a spirit of sublime altruism on the principle that eggs are eggs. Instances are on record of intended victims which have either thrown out the parasite's egg or built a new nest on the top of it, but that this was due to the colour of the offending egg has not been demonstrated, whereas a very large proportion of the young cuckoos are hatched from eggs which do not resemble those of their foster parents. These eggs are either accepted without question, or because the victim has been unable to eject them or not had the strength of character or intelligence to build over them.

There is no evidence, therefore, that the colour of the cuckoo's egg is being selected; on the contrary, there is overwhelming evidence that it is not. This may or may not be why it varies so extraordinarily. In any case, the egg appears in so many different guises that it is impossible to say what is its typical colouring. Among its infinite varieties there are certain common types, and these are usually found in the nests of favourite foster-parents whose eggs they mimic. The pied wagtail's eggs are almost invariably imitated, and others quite different are so often mimicked as to leave no doubt as to the intention. On the other hand, the hedge sparrow is one of the common foster-parents, but it is seldom, if ever, that a cuckoo's egg taken from a nest of this species in the British Isles in any way resembles a hedge sparrow's egg. There is a well-known blue type of cuckoo's egg, however, specimens of which may be seen in the Natural History Museum, South Kensington. This type is not found in Britain, but it seems to

be not uncommon on the Continent, and the records show that it is placed only in the nests of species whose own eggs are blue.

The truth seems to be that each cuckoo lays her eggs in the nests of the species that reared her. The result of this is that there are many strains of cuckoo each parasitic on a particular species. In time each of these strains tends to lay eggs that imitate more or less closely the colouring of its victims' eggs. It is assumed by scientists that this is due to the rejection by the foster-mother of all those eggs that less closely resemble her own. One objection to this theory is that a bird's own clutch frequently contains an egg that differs widely in colour from the rest yet it is not rejected, but another much more serious is that the theory does not account for the strain of cuckoo which victimises the redstart and which lays a pure blue egg. The redstart nests in a hole where the difference in shade between one egg and another would not be noticeable. When the cuckoo places her egg in the redstart's nest, however, she picks up one of the redstart's eggs and flies off with it in her bill. Thus, though the redstart may not be able to distinguish the colour of the cuckoo's egg, the cuckoo is in the best possible position to know the colour of the redstart's, and as this is always blue, her system, through the medium of her eyes, may be so stimulated by it as to cause her in time to enamel her own eggs a similar shade. That such stimulation may take place seems to be confirmed by the opposite effect which nesting in dark holes has on the artistic powers of such birds as are capable of laying coloured eggs, for example, the puffin and the starling. Deprived of light at the critical moments when the final touches are given to the eggs before they are laid, these birds are gradually losing the gift of colouring the shells. This is clearly illustrated

by comparison between the egg of the puffin which nests in a burrow with those of its near relatives the razorbill and the guillemot which lay on open rock ledges and produce gorgeously coloured eggs. It is also illustrated by a comparison between the eggs of the song thrush, the missel thrush and the blackbird which nest in the open air and lay richly coloured eggs, with those of their near relative the wheatear and the redstart which nest in holes and lay pale blue eggs, and between the egg of the jackdaw which nests in holes and those of its cousins the rook and the crow whose nests are open to the sky. It is only fair to add that whereas the kestrel and the sparrow hawk lay beautifully and elaborately coloured eggs in open nests, their relatives the harriers, whose nests are equally exposed, lay white eggs. As the harrier's eggs are laid on the ground they cannot be classed with the white eggs of the hole-nesting species, though they are usually surrounded by tall reeds and are further protected by the dangerous character of their owners. So it is reasonable to assume that these birds lay white eggs simply because they have not developed their artistic qualities in this direction.

As the mimicry of the cuckoo's egg is not being improved or limited by natural selection, as it is quite unnecessary and therefore useless yet nevertheless persists, we can only assume that it is purely a matter of interest to the artist herself. She has evidently powers of imitation in colour, and as these are a natural gift and she has not had the advantages of a Slade School education and is limited to what would seem to be a very uncertain process, her achievements are marvellous. In the circumstances it is not unnatural that she should have failures, that certain individuals or strains should be more gifted than others, and that among these some, like many well-known human

artists, should have a special flair for particular colour schemes.

The cuckoo's æsthetic sense and faculties have no doubt been stimulated by her unique knowledge of the studios of the countryside. Naturally the experience of other species is confined to their own productions and their tastes and aims are accordingly narrow, in addition to which some are further limited by the necessity of keeping to a special colour scheme for the sake of protection. Each, however, has brought her one idea to a state bordering on perfection, and in many cases has modified it to harmonise with the peculiar tints of her nesting site. But even under these cribbed conditions individuality asserts itself. And as for the extravagant variations of the guillemot and the razorbill eggs, why, after all these may not be "variations" in the orthodox sense of the word, but what in higher circles is generally recognised as originality.

In considering this idea it is necessary to look at it broadly and not with the rather narrow view of the superior creature that possesses a hand. The works of man are very wonderful, but the human hand which accomplishes them is only an organ. What can be accomplished with one organ can be done also with others. Man makes nets with his hands, the spider makes nets with her spinnerets which are not hands, and the caterpillar makes nets with its mouth. Similarly man produces beautiful colour schemes with his hand, using pigment derived from the earth; the bird produces equally perfect and elaborate colour schemes through the medium of the skin which is another organ, and also uses pigment derived from the earth and other more ingenious methods of colour production. The oviduct is another organ and with it the bird is able to enamel eggshells with beautiful pigments which are also derived from

the earth. The essential difference between the artist's and the bird's painting is that the one is conscious and the other unconscious. We say that the artist's originates in his consciousness, but as we do not know what consciousness is and as we have never been able to penetrate beyond it and to fathom those marvellous operations which are constantly being carried on by the body unconsciously, we cannot say that the two types of operation have not ultimately a similar origin.

CHAPTER SEVEN

BIRDS' NESTS: THE YOUNG BIRDS

WHILE I was watching my hen chaffinch building I saw something else of great interest. A thrush came flying silently and secretly through the wood and snuggled down into her nest. I cannot say how long she remained there, it might have been an hour or perhaps less, but she left again before I had to go, and she went as silently and secretly as she had come. When I examined the nest I found that meanwhile she had laid an egg. That is not a remarkable thing in itself, of course, but it is when compared with the habits of other species. Chaffinches, for example, lay their eggs during the night. The hen goes to the nest every evening about sunset, and when she leaves in the morning she has added one to her clutch. Tits seem to do the same thing. Probably there are records up and down

the country that would show what species besides the thrush lay by day, whether each has some regular time for laying, and also what others beside the chaffinch and the tits cover their eggs at night before the whole clutch is laid.

This last seems to be an important point, because the eggs as a rule are laid at the rate of one each day, yet though some of them are brooded longer than others, they all hatch about the same time, or at any rate, within twenty-four hours of one another. Lapwings and similar birds do not sit on their eggs during the day until the clutch is complete, but I have not been able to ascertain whether they cover them at night, nor at what period of the twenty-four hours the eggs are laid. With these and other birds whose full clutch is only four or five eggs, a delay of a few days would not be a serious matter provided that the eggs did not suffer from cold, or on the other hand a partial brooding of the first eggs would not hasten the development of the chicks more than a few hours. But what happens in the case of partridge, grouse and tits, which may lay a dozen or more eggs and thus make a difference of nearly a fortnight between the appearance of the first and the last ? It is obvious that ground-nesting species, whose young are able to move about as soon as they are hatched, could not afford to have chicks appearing at twenty-four hour intervals over a period of a week or a fortnight. Their families must be of an age so that they may all have an equal chance, especially when they reach the stage of learning to fly. Similarly, birds whose young are confined to a small nest for a fortnight or three weeks, must hatch all their eggs within a day or so of one another, otherwise the late-comers might be smothered by their elder brothers and sisters. Perhaps the warmth of the mother's body when she sits on the nest at night only is not given continuously

for long enough to cause any considerable change in the eggs, but is just sufficient to keep them from being chilled by the night air.

Owls are exceptions. They lay their eggs at intervals of about forty-eight hours, and begin brooding the first. Consequently their young are hatched at similar intervals, and it is possible to find, say, a barn owl's nest with young at three stages of growth and also several eggs. These eggs the young help to hatch while the mother is hunting for their food.

The period of incubation varies according to the species, from about two to three weeks. In some species it is still longer; the sparrow hawk, for example, broods her eggs for about five weeks. The whole of the brooding is in many cases done by the female. This is the practice with which we are familiar among our barn-door fowls, and it therefore seems to us the most natural. The cock bird meanwhile fetches food for his mate. This is quite noticeable among the rooks, and until I understood it, I used to believe there were young in the rooks' nests long before it was time for the eggs to be hatched. It is easy to make the mistake, for unless you watch the rookery closely you do not know when the hen begins to sit. Then one day you notice a bird coming to the nest and hear the excited cawing as he arrives and the happy gurgling as the bird in the nest gulps the food down, and you at once think of the feeding of young birds.

There is in the rook, however, as there is in most of the crow family, a sense of fun, and this shows itself in the cock bird's playful habit of teasing his mate. He does not always go to the nest when he comes home, but sometimes settles on a neighbouring branch and caws in reply to the hen's urgent greeting, as much as to say he has brought nothing with him, that food has been very scarce to-day,

or that he has been robbed on the way home. It is a doleful tale; but his wife knows better. After repeatedly trying in vain to get him to be sensible, she leaves the nest and hops over to his perch, and at last after much persuasion and heartrending demonstration of helplessness, he consents to part with the fruit of his hunting. This charming scene is likely to be missed by casual observers, for unlike the thrush, the rook does not bring home food in his bill, but carries it in a pouch under his tongue. The outward and visible sign of this is a large bulge under the beak which can be seen only when we view the bird from certain angles. It has been suggested to me that the whole thing is merely rook cunning, that the wily old male wishes to keep the tit-bits to himself. But in that case why should he bring them home at all ? While his mate is brooding he has the whole day in which to disport himself and can feed to his heart's content on the fat of the land, and surely if he wished to keep anything to himself his simplest plan would be to swallow it where he found it. Besides, an important part of his love display is the presentation of dainties to his mate, and he probably derives pleasure from this graceful act as a man does in giving his wife a present. The male rook's seeming unwillingness sometimes to part with his gain at the nest is either an attempt to prove that he is lord and master, which is unlikely, or, as I think most probable, it is pure teasing, with perhaps a desire for the additional pleasure of being wheedled. That the voice of the wheedler is harsh to our ears signifies nothing; it is doubtless as sweet as honey to his.

If this be the true explanation of it, the practice is another of those delightful bits of uselessness that make bird life so attractive to ourselves. It is possible to argue that the male rook is merely a slave of an instinct which constrains him

Rook about to feed its Mate.

to withhold his offerings now and then in order to force his mate to leave the nest, for without such intervals she would die of cramp or rheumatism or would smother the chicks in the eggs through allowing them insufficient ventilation. But we need only turn to other birds to find a full answer to our ingenuity. The cock thrush, blackbird, robin, chaffinch and others also feed the hen on the nest, but nevertheless she has enough sense to care for her own health by leaving her nursery and stretching her wings for a few minutes several times a day. We are told that no habit can be developed by any creature unless it serves a useful purpose, and that even then it can be evolved only by the merciless weeding out of those individuals in whose composition it has been omitted or indifferently represented. In that case it would be necessary to assume that teasing is an essential part of rook economy and that all male rooks which had failed to tease their wives had been abolished as unfit. But can we also assume that the stealing and hiding of diamond rings are an essential part of jackdaw, magpie and raven economy and that all individuals of the three species, which have been inefficient in these great arts, have been destroyed as too good to succeed in the struggle for existence ? These members of the crow family when kept in captivity have given ample proof that they are possessed of at least an elementary sense of humour, so it is reasonable to accept the rook's teasing as evidence that he is also endowed with this social virtue. Humour and the stealing and hiding of diamond rings are quite useless qualities to a bird, and are therefore unselectable, but no doubt they add to the pleasures of life.

I have not noticed any sign of coaxing when the male harrier feeds his brooding mate. He comes sailing along over the marsh with a victim in his foot, and as he nears

the nest the hen flies up to greet him. When he is just above her he drops the food and she, turning on her side, catches it with her foot as it falls. Then she alights to eat it, and he passes on to hunt for more.

In many species the male, instead of feeding his mate on the nest, takes his share of the brooding while the hen stretches her wings and picks up what food she requires. In all cases that have come under my notice, however, as soon as the chicks are hatched the male parent begins to work hard, and for the first three or four days he fetches the food both for his mate and for the family. During this period he is not allowed to feed the chicks himself; he gives what he has brought to the hen and she passes it on to the chicks, perhaps partially digested. From this it would seem that the cock must remove the empty shells from the nest, but whether this is the fact or not I cannot say, as the only birds I have seen carrying the shells are starlings, and in that species both sexes are alike. At all events, it is noteworthy that the birds are careful to drop these tell-tales at a distance from the nest.

Rearing a family of helpless chicks is a heavy task, and for a fortnight it involves constant labour for both parents from dawn to dusk. The amount of food required is enormous considering the size of the infants, but is accounted for by the rapidity of their growth. The provision of a suitable diet in sufficient quantity is a serious problem, and it has been solved in various ways. The procuring of the food is a comparatively simple matter. There are ample supplies in the territory and they multiply faster than they can be used. Picking up enough for the family in addition to what they require for themselves means only doubling and redoubling their efforts; the chief part of the problem is the transport. Some species are still only fetchers and

carriers; others have invented labour-saving methods. The thrush collects a whole beakful of worms, half a dozen or more, which she doubles up and holds crosswise between her mandibles, and with this bundle she flies to her nest where she distributes the fare equally among her offspring. This practice is clearly an example of common sense; it saves her many journeys. I have seen a thrush throw her first three worms on the ground where she had extracted them, leave them squirming there while she went on with her work, and when she had nearly completed her load, come back to them, pick them up and fly off. There was something startlingly businesslike in her actions as she did this, suggesting that she had worked the whole thing out in her head, and that she knew the capacity of her bill to a worm and how many more she could carry after she was too fully loaded to make further extractions. Labour-saving is the rule among wagtails too, but of course the nature of their food is different. They hawk for insects on the wing or by running hither and thither on the ground, and when they have caught as many as they can carry, they take their load to the nest and return presently for another. These birds seem to rear their broods on adult fare from the beginning and without any preparation. The finches, which are seed-eaters, feed theirs on insects, chiefly caterpillars, which they collect in their crops instead of in their bills, and disgorge when they reach the nest. Probably at a later stage they deal with seeds in this way also and give them to the young in a half-digested state, and finally, when they leave the nest, instruct them in the art of cracking seeds and eating the kernels raw.

Birds that collect food visit the nest only once in ten minutes or so even at their businest, and thus save themselves much labour, which, as I have said, is good sense.

Tits seem to bring only one insect at a time, and as they have large families, they are constantly flitting to and from the nest, one or the other arriving about every minute throughout the long summer day. The warblers also fetch only one insect at a time, and so do the spotted flycatcher, the robin and the yellowhammer, and probably the chaffinch, though this bird usually carries the food inside its mouth. The terns bring one small fish at a time and so does the guillemot, but the puffin and the razorbill carry a load of about half a dozen in the bill on each visit to the nest, and the cormorant, gannet and heron take a large quantity in the crop. It has not been shown, so far as I know, that these various methods of fetching are instinctive, and of course, they need not be, for each is demonstrated to the young birds hundreds of times every day for a fortnight or more, and this in the nature of things could not but leave a lasting impression on them.

There is a great difference when we come to that extraordinary bird, the pigeon. I shall never forget the shock of astonishment with which I first observed a pigeon drinking "like a Christian," sucking in water and swallowing mouthful after mouthful as we ourselves do, instead of in the manner of such unregenerate creatures as the hen, the dog and the cat. I think my respect for birds dates from that moment. I felt then that there were some possibilities for them after all in spite of the natural history books, which in those days seldom rose above the level of "the lion roars" and "the dove coos." Here at any rate was a habit which I had discovered myself and about which the writers of books seemed to know nothing. I could now add something real to the wooden history of the pigeon, and I developed a huge appetite for more knowledge of a similar kind, which I am happy to say has never been satisfied.

Besides being revolutionary in this matter of drinking, the pigeon has developed an original method of feeding its young. The majority of birds do this by placing the food carefully into the throat of the chick, which opens its mouth wide to receive it the moment the parent arrives. The pigeon does the very opposite. The mother opens her mouth and the young one thrusts its head into the cavity and there obtains a plentiful supply not of worms, nor grubs, nor half-chewed seeds, nor anything on which birds usually feed, but of milk, or at any rate something resembling milk in consistency.

Among nestling instincts the noisiness of young birds bred in holes, for example, the starling and the swift, should be compared with the silence of those hatched in more exposed situations, such as blackbird, hedge sparrow, robin, and so on. There is no need for the former to repress themselves, so they give lusty expression to their excitement, to their desire to have everything no matter what may happen to their brothers and sisters, and to their satisfaction when fed. The latter being open to attack from all kinds of marauders dare not make a sound, but manage to express wonders of feeling in the silent gaping of their enormous mouths.

This difference in the youngsters has its counterpart in the parents. The rook has no need for caution. She cannot hide her nest, but she knows it is well out of reach of most of her enemies. She goes straight to it, calling loudly the while. The starling will sometimes fly direct to her nest, but usually she alights on some neighbouring branch, chimney or gable before entering it. Invariably she calls as she approaches, and immediately there is a tell-tale answering clamour from her hungry family. If she fears danger she will not enter at once, and will even retire for

a time, leaving her disappointed chicks to wail themselves into silence. But when she does enter she announces herself at the doorway. Tits do the same, and one parent, waiting outside on the doorstep while the other is within, may call to his mate sharply to "hurry up as there is a lot to do and I can't sit here all day!" Young woodpeckers keep up a constant "chanting" while they are waiting for the visits of their parents. Birds with open nests approach them secretly. Some, like the skylark, alight at a distance from the home, and run to it by a well-hidden path among the undergrowth. Others go first to a regular look-out post and make sure that the coast is clear, and the missel thrush is so wary that she will fly to and fro scolding for half an hour, still holding her mouthful of worms, rather than visit her nest while a possible enemy is within a hundred yards of it.

The approach to the nest, whether it is by one or more stages, is nearly always the same. This is only natural, as it saves time to go by a well-known route. But it is seldom, if ever, the same for both sexes. Each has its own look-out post and its particular perch at the nest itself.

When a parent bird approaches the nest she may give a call which means "ready," and immediately the whole family open their mouths to the fullest extent in silent preparation for the expected meal. But even should she omit the call, the slight rustle she makes as she alights and passes from the twig to the edge of the nest has a similar effect on the young ones.

In many species the inside of the young bird's mouth is brightly coloured and also the loose skin at the edge which enables it to open so enormously. The young of a few species in addition have spots on the tongue and palate. These colours and spots are supposed to be guides to the parent to save her time or make sure that she does not over-

look any of her family. I doubt whether this is the true explanation of the phenomenon, for birds that nest in holes would gain nothing from such a provision and yet they rear their families successfully. But whether it is true or not, it is certain that the mother knows her chicks one from another and she distributes the food impartially among them. At first she cuts it into small pieces and places these in the several mouths, taking care to put them well into the throat. Even with that she is not always satisfied. When she has given each its share, she makes a rapid inspection of the still gaping mouths, and may insert her bill again into one or another and push the food firmly home. Then she departs, and at once the mouths close and the heads subside, but they pop up just as hungrily on the arrival of the other parent a minute or so later.

The great care with which parent birds feed their young is best shown by the practice of the birds of prey. When a hawk makes a capture, he first tears off the head of his victim and devours it himself, that part being unsuitable for the digestions of the chicks. He then plucks the body and carries it to the nest, where it is torn into small pieces by the hen who gives the tenderest parts to her hungry family. When the chicks are older and stronger such strict dieting is not necessary, so the victims are then dismembered on the nest and the family are left to pick up the bits. Later the prey, dead but otherwise untouched, is brought to the nest and the youngsters tear it to pieces themselves.

Terns at first are careful to place their fish well into the expectant mouth of the chick, but later they drop it on the ground and so teach the youngster to pick it up.

Young cormorants have to help themselves from the very beginning. The parent brings home a load of fish in the crop and allows each of the chicks in turn to inser:

its head into her mouth, thrust its beak down her throat and take its share of the store.

In very wet or very hot weather a mother bird devotedly sits on the nest and shelters her family with her body and half-open wings. The hawks are admirably tender in this respect and undergo the greatest discomfort to protect their chicks from the blazing sun in the heat of the day. When a similar solicitude is shown by a duck for her amphibious brood in a heavy downpour of rain, we cannot refrain from smiling. Possibly raindrops, beating forcibly into the down of a duckling, may reach the skin and cause discomfort or illness through the water of the pond is warded off by the oil and the disposition of the coat.

This is a different order of maternal care from the blind devotion of the foster-parents who rear a cuckoo, the ungrateful murderer of their own offspring. But even they have to modify their methods in order to deal with this giant changeling. They are so much smaller than the cuckoo when it is half grown that they find it necessary to sit on the creature's head in order to pass the food into its mouth.

If when the parent nears the nest, she should observe a possible enemy in the vicinity of it, she will utter a warning note. The young recognise this as such and obediently remain snuggled close together in the nest, or if they have already stretched up their heads and begun to cry for food, as they will when they are nearly fledged, they at once subside and lapse into silence. So instinctive is their recognition of this note that even a chick that has just begun to break through the shell is believed to hear it and obey. This may be true, and there is no reason why it should not be; but the mother's call has not affected waterhen chicks when I have been watching them hatch.

When the time comes for the young to leave their

nursery, the difference between the two types of bird is reversed. Swallows and martins remain in the nest for about a month, and when at last they venture forth they are able to fly well, though they take long rests on house-top, tree, or telegraph wire, and wait there to be fed. Young swifts make their first public appearance at the end of six weeks, but then they are full grown and as well able to fly as their parents. Indeed, after a few days' practice they start on their long journey to Africa. I have not yet observed young swifts being fed after they have flown, but I have often seen swallows and martins feeding their young while they are on the wing. If you watch them as they flit to and fro in the sun, you will notice that at short intervals two of them meet, twitter excitedly and stop for a second in mid-air as if they were kissing. One of them is a youngster that has been merely playing, enjoying the pleasure of flying, and perhaps chasing an insect now and again for fun, and in doing so it has been strengthening its wings and learning some of the tricks by which insects escape from birds. The other is its mother, who has been hard at work catching insects to feed her family. She gathers a little ball of them in her mouth, calls one of her chicks, drops the ball right into its throat so that there is no chance of its falling out and her work being wasted, and then begins again. When the young ones tire and settle to roost on telegraph wires or wire fencing (and where these things exist swallows seem to prefer them to any other kind of perch) the mother goes on with her duty. Presently she approaches them with a pretty twittering call, and hovering before one of them, pops some food into its gaping mouth and goes off for more. She does not alight, so her hawking is hardly interrupted by her visits. She comes, twitters and is gone in a moment.

At the age of three weeks the young tits come into the daylight and at once they are able to follow their parents about from branch to branch or on short flights from tree to tree. It is then a pretty sight to see the mother calling her chicks about her and demonstrating to them where to look for their insect food and also what to look for, and at the same time encouraging them to pick up the creatures for themselves. Young blackbirds and thrushes and other birds whose nurseries are open to attack, fly at the end of a fortnight, and they are not nearly so well prepared for the adventure as the tits and the martins. At first their wings are feeble and their flights uncertain, and for several days they are a danger to themselves, though as they are separate, each has a better chance than if they were to be found by some prowler huddled together in the nest.

Instinct which has served them well enough in the nest seems to desert them the moment they perch on the edge of it, and henceforth they have to be taught. We are so used to applying that word "instinct" to the explanation of everything in Nature, that this discovery comes to us as something of a shock. They have even to be taught how to fly. The lesson is quite simple, and consists in showing them how to do it and encouraging them to try. The mother flies from the nest to a neighbouring branch and, perching there, calls to her chicks to follow. She repeats this again and again, till at last one by one they summon up enough courage to make the attempt. When they leave the nest they flutter their wings, partly because they have seen their mother doing it, and partly from sudden terror at finding themselves falling; and their wings, being made for flying, support them.

If they manage to reach the branch beside their mother they grab at it by instinct, and their feet, being made for

perching, clutch it and hold it tight ; but even then it is with the greatest difficulty that the terrified youngsters keep themselves from overbalancing.

After that for many days they are constantly learning lessons in the difficult and wonderful arts of starting, flying and alighting.

They have also to be taught how to feed themselves. While they were in the nest every scrap of food they ate was brought to them by their parents, and now that they are out in the wide world, instinct tells them neither what to eat nor where to look for it, so they still expect and cry to be fed.

It is amusing to watch a hen robin, her tail well cocked with importance and pride, giving her great speckled son a lesson in how to find worms and caterpillars and how to catch flies. While she hops briskly along, now picking up something here, now darting to capture something there, he, who looks about twice her size, follows her about helplessly, opening his mouth and crying babyishly till she pops something into it. But presently, having shown him many times how to help himself, she flies away and leaves him. For a moment or two he is dazed, and then, instead of trying to do what she has been doing for him, he flies off after her. And this is the strangest part of it all, for though he has been long enough away from the nest to have become a skilful flier, he doesn't yet know that food is food until he sees it in his mother's bill. What has become of his wonderful instinct ? Ever since he was hatched it has told him that all he has to do is to open his mouth and swallow the food that is given him; and now he has to learn by experience what that food is and how to secure it. And it is only after he has been many times shown and then left to himself that he begins to understand and try.

It is quite different in the case of partridges, lapwings, wild duck, moorhens, and similar ground and water birds. When their chicks are hatched, the hollow in which the eggs have lain is not a place of safety. So as soon as they break from their shells the youngsters are able to run about and peck. They do this by instinct, just as a young robin opens its mouth to receive food, but having no experience they peck at everything, and so have to be taught what they should eat.

This can be seen in any poultry yard. The mother hen takes her chicks about with her and they run here and there and peck at this, that and everything; but when she finds something they ought to eat she calls them, and at once they run to see what it is, whereupon she makes signs that she wishes them to snap it up. She often does this even when she has nothing to offer, just by way of encouragement, as a mother or nurse may urge a child to "eat up his posh and grow as big as daddy." There can be no doubt that the intention is the same in both cases, though the hen has advanced so far towards sophistication that she will make a pretence of having found something good when her real purpose is to gather her brood about her.

Young water birds swim, feed and dive instinctively. They dive either for food or to avoid danger. Mallard ducklings at first feed on the surface. When they are half grown they dive for their food and are encouraged to do so by their parents who never themselves feed in this manner. The flappers have to plunge because they are not yet large enough to reach the mud by tail-tilting and yet are too large to be satisfied with such food as they can obtain on the surface.

As young running birds have no nest in which they can snuggle in safety, they have to be able to protect them-

selves, and as they cannot fly and are not strong enough to fight their enemies, instinct tells them to flop down flat on the ground at the first sign of danger, and lie there perfectly still, while their mother flies off and by showing herself plainly, attracts the intruder away from them.

This is much more wonderful than it sounds. Most bird books mention it, but it is one thing to read about it and quite another to find a young lapwing. I had read about it before I saw lapwing chicks for the first time, but I was quite unprepared for what happened. One moment I was looking at three young lapwings, and the next there were none; they had vanished before my very eyes. I marked the spot where I thought one of them had disappeared and approached it carefully; but even when I was standing almost over it, it was some time before I could make out the form of the chick. I failed altogether to find the other two. Their down is a reddish brown, which matches closely the colour of the earth, and it is marked with black splashes which, strange to say, help to deceive the eye. Other birds have similar protection. When they leave the nest and scatter they have to call repeatedly as a guide to the parents. Unfortunately this is also a guide to enemies, but the moment the youngsters hear their parents' warning note they become silent and remain still. Their plumage is then a good friend to them, for it is usually dull like their mother's or duller and does not attract attention. Young chaffinches seem to be all hens, young robins are all speckled brown, and young blackbirds are dull brown with darker markings. This, however, is such an important subject that I deal with it in another chapter.

Ducks as a rule nest on the ground near the lake or pond in which they feed. Sometimes a duck may have to go a considerable distance from the edge to find a secure hiding

place, but wherever it may be she leads her family to the water almost as soon as they are hatched. The shelduck nests in a burrow which she digs in a sandhill, but she feeds on the mudflats at low tide. Often her nesting site is several miles from the shore, yet she sets out at once with her downy offspring trailing behind her to do the long journey on foot. Where suitable cover is not to be found on the ground, a duck will often make her nest in a hollow in the top of a pollarded willow, or a hole in the fork of a tall tree, or even in an old pigeon's nest, many feet from the ground. She cannot feed or rear her family in such positions, so she has to bring them as soon as possible to the lake. The ducklings are able to run and swim the moment they leave the egg but they cannot fly, and yet their mother will lead them triumphantly to the water unless they are intercepted and destroyed by beast or bird of prey. In order to induce them to leave the nest she coaxes them by her calls and takes short flights to demonstrate the use of their wings, just as a thrush or a blackbird will do, and one by one they trust themselves to the air and drop to the ground. Their wings, which are too small and feeble to support them, no doubt help to break the fall, but in any case they alight safely. But if one of them should be too timid to leap, the mother will seize it in her beak and drop it from the edge of the nest.

The guillemot and the razorbill, which nest on high rocky ledges, have a similar problem to solve. The young birds reach the sea before they can fly, and they accomplish this by jumping from their rocky nurseries and gliding down, for though their muscles are not strong enough for flight their wings when expanded are planes which are sufficient to save them from somersaulting and to carry them clear of the lower shelves.

The woodcock nests in woodlands but feeds in the marshes, and at all times she sleeps by day in the woods and visits her hunting grounds at night. Her young are able to run and to pick up food as soon as they are hatched, but they cannot find their natural prey on the dry floor of the wood. The mother therefore carries them to a suitable spot in the marshes usually supporting them between her legs, sometimes with the aid of beak or tail but also on occasion taking one or more on her back. This may be seen by any one who cares to watch, for the woodcock leaves the wood every evening by the same route, and once that is discovered, it is easy to hide in a position from which the bird may be observed against the sky as it flashes out and away.

So long as they have eggs or young in the nest the parent birds can keep their secret very well. They always approach or leave the nest with the greatest caution. When the hen is brooding, the cock pays frequent visits to his several look-out posts, and while he is singing there he keeps his sharp eyes open for any sign of danger. If an intruder enters his territory he utters his warning note. His mate may then leave the nest quietly and cautiously, and if she does so she will probably appear in another part of the territory. Both birds will then show themselves conspicuously either until the enemy has passed on or until one or the other has led him to a safe distance from the nest. More often the hen will remain on the nest until it must seem impossible that she can escape detection. In many species the hen is known as a "close sitter."

But from the moment the young birds leave the nest, the lives of the parents become one continual state of anxiety. There are so many enemies everywhere, and the chicks, especially those of the ground and swimming species, are so charmingly childish and unsophisticated. When

young shelduck first emerge from the burrow they are devoid of fear and if a human being should happen to be standing near, they may blissfully run up to him. This suggests that fear is not instinctive in young birds but is instilled into them by the fussiness of their mother.

The young hawks and owls are able to protect themselves even in the nest. When danger in the form of bird, beast or human being threatens them they throw themselves on their backs and strike out with their formidable talons. Whatever parent hawks may do when beast or bird approaches their chicks, they are shy of human beings, but an owl will attack a man in defence of her offspring and as she aims at his eyes, her assault is dangerous. Terns and skuas plunge at intruders and even sometimes hit them on the head with force enough to knock off a hat, but usually they avoid the blow, either because their courage fails them at the last moment or because their intention is only to menace the enemy and so drive him off. They have much experience of the value of this latter manœuvre, for they "mob" any crow, hawk, or heron that may venture to cross their territory, and in all such encounters the offender retires without a blow having been struck on either side.

Lapwings also mob hawks and crows, but when a dog or a fox or a human being enters their field they resort to another ruse. One or the other of the parents flies away but with a show of difficulty, as if it were wounded. The object of this gesture is clearly to attract the attention of the foe and draw him away from the young, which instinctively crouch and become invisible in obedience to the mother's command. For, the moment the seemingly wounded bird realises that she has achieved this, she swings up buoyantly into the air in a manner and with a call that almost suggest derision. Other species act in a similar way.

I once spent an hour following the doings of a family of waterhens. As I approached their pond, overtopping a slight rise in the ground, the mother flew up and settled among some bushes about twenty yards beyond the rushes on the opposite bank. I knew by the manner of her going that she had a family, for she made herself as conspicuous as possible and alighted in an unusual spot ; a waterhen as a rule, at the approach of possible enemies, is content to swim quickly to the farther side of the pond or stream, and hide among the rushes or other suitable cover at the edge. At first I could not see the young anywhere, but after waiting quietly for some minutes, I thought I noticed a movement among some floating weeds. About the same time the mother appeared warily at an opening on the opposite bank, and scouted to make sure that the coast was clear. Two or three times she did this, and at length being satisfied, she called. I had already begun to wonder whether two dark patches among the weeds in the middle of the pond could be her chicks, though there was nothing in their shape to suggest this, but now the two heads appeared, and the young birds started to paddle their way towards their mother and safety. She had to call them repeatedly before she could get them to hurry.

How they managed to hide themselves I cannot say exactly, but in any case even to my practised eyes they were at first invisible. It is possible that they simply lay flat on the surface with their heads stretched out and half submerged, in a similar attitude to that adopted by young lapwings on land. This is what they were doing when I first noticed them; but waterhens, young and old, can dive well and can remain submerged under water with only the beak protruding to obtain air, so probably the first movement that attracted my attention was their emergence

Moorhen and Chicks.

on to the surface. If it were, they accomplished the change very skilfully and cautiously.

When the mother had at last got her chicks under her care again her anxiety was not over, for some people then approached by a path that passed near her side of the pond. This time she did not fly away. She knew that she was hidden, and if she had been alone she would no doubt have remained quietly where she was, but her fear for the safety of her family was so great that she felt she must get them right out of harm's way. So she manœuvred along the bank under cover, peeping out every few yards, when she had made sure that there was no danger so far, and calling to her chicks to follow her, then, when they had done so, going a little farther. Now and again she had to scold them for venturing into the open, which they were much given to doing, not themselves realising the importance of being hidden (another matter apparently which they have to learn from experience), and at her warning note they would hurry back into shelter of the reeds. In this way, while working them gradually round to the quietest part of the pond, she gave them some valuable training in scoutcraft.

Similar movements had to be carried through several times, as intruders approached from various directions. The old bird was wise and the lessons were good, though the chicks were never in any real danger, except once, when a terrier came a-hunting at the edge of the pond; but a mother waterhen is much too clever to be caught napping by a stupid, barking dog.

The great crested grebe, which has become one of our common water birds in recent years, assumes more direct responsibility for the lives of its young. When danger threatens, the parents do not fly away and leave the family

to take care of itself. Instead, they allow the chicks to climb on their backs and then swim off with them to a place of safety. The little grebe, or dabchick, which is common everywhere, in like circumstances takes her young under her wings and dives with them.

But however careful a mother bird may be, she is fortunate if she succeeds in rearing her whole brood, for, as every observer of nature knows, the toll on the lives of young birds is very heavy. It begins in the nest itself. Though the parents are impartial in their distribution of the food, the weakling gets no consideration from its more vigorous brothers and sisters and may even be smothered by them. If it survives to leave the nest it is feeble and timid, and falls an easy victim to the first hawk or other enemy that may cross its path. In other words, the strong have a better chance of growing up than the weak. The weak, indeed, have no chance at all, but they are a very small proportion of the total. They are the first to be eliminated, but the mortality among the fit is appalling. Whole families of them are destroyed in the nest either by adverse weather conditions or by prowling and climbing beasts or predatory birds. When they have flown, they are killed in large numbers to provide food for the young of other creatures. Some parents may lose several families in a season, others may rear two or three broods successfully, and, though to us the marvel is that any of them ever grow up, the general result is that, at the end of the summer, most species are much more numerous than they were at the beginning.

CHAPTER EIGHT

BIRDS AT WORK

EVERY ONE who has a garden has watched the ordinary method by which the song thrush obtains his food. He alights on the lawn, takes a hop or two and pauses in a listening attitude, then suddenly makes a vicious dab at the ground with his beak. The action is very rapid, yet as he withdraws, he drags a squirming worm from its burrow. Sometimes he may have to give a sharp extra tug if his victim is large, but almost invariably he secures his prey. The blackbird, the missel thrush, the fieldfare and the redwing work in a similar way, and in autumn and winter it is possible to see all five species busy at the same time in one field. The blackbird also has a habit of working in dry ditches or in shrubberies where, by turning over the dead leaves, he makes many a good meal.

Besides worms, the common thrush has a predilection for snails, and he deals with the difficulty of the shell in a practical way. He seizes the shell by its lip and carries it to a flat stone, and on this he batters it until he smashes it. A thrush will use one stone for this purpose many times, and such stones, which are recognised by the debris of broken snail shells surrounding them, are known as thrushes' "anvils."

Robin, nightingale, stonechat, whinchat and redstart pick up insect food from the ground, but their method of hunting for it differs from that of their cousins. When a gardener is digging, a robin will alight near by and keep a sharp look out for tit-bits as the soil is turned, and when a worm or grub appears, he will dash in and fly off with it, only to return in a few moments to watch for more. But when he has no such helpmeet, the robin passes from point to point along the hedgerow till he spies some suitable prey, then drops down and secures it and a moment or two later flits back into the security of the hedge. This action is typical of the other four, and also of the wheatear, though in a modified form owing to the absence of bushes in his habitat. It often draws attention to them and serves as a first rough guide to their identity, especially when coupled with the character of their surroundings.

The starling also feeds on our lawns and many casual observers confuse it with the blackbird in summer. A friend once told me that in winter he was unable to distinguish it from the thrush, but he had noticed that while they were feeding on the ground the one hopped and the other ran. It is the starling that runs and he is always restless and fussy, never deliberate and patient like the thrush family. This bird is an insect-eater and is an invaluable friend to the gardener and the farmer. He visits lawns and fields to

obtain the notorious leather jacket and wireworm. In a single day a flock of starlings must devour huge numbers of these destructive pests.

The tits and the warblers live on insects which they find on the branches of trees. The warblers hop along the boughs and pick up a fly, a beetle or a spider here and there as they go. The tits do this also, but they seem to prefer the minute creatures which lurk in or around the buds, and they hunt for these even to the topmost bud of the tiniest twig, performing many amusing acrobatic feats in the course of the search.

Other insect-eating birds employ different methods of securing their prey. The pied wagtail hunts on the ground and runs swiftly hither and thither to make each separate capture. He has to be quick, for the insect may settle only for a moment. Often it flies off just before he reaches it, and then he finishes his run by springing into the air and taking it on the wing.

The flycatcher almost invariably captures his prey in flight. I have described in Chapter Two how he launches himself into the air to seize some luckless fly and returns to his perch. This he does regularly enough for it to be recognised as a habit, but frequently he alights on another perch and I have watched a spotted flycatcher travel thus in stages for about two hundred yards along a row of trees, taking toll of the insect life of the road as he went.

A somewhat similar method is employed by the red-backed shrike or butcher bird. He also feeds to a great extent on insects, but seems to prefer the larger varieties such as beetles, bumble-bees and so on, and he keeps a sharp look out for them from the top of some favourite thorn bush from which his keen eye commands a wide range of his territory. Now and then he will fly down to the ground, secure his prey and return to his perch, and while I have

been watching him, I have often been surprised at the distance he will go on one of these trips; he must have remarkably keen eyesight. This is his custom, but frequently he will pursue and seize an insect on the wing. Besides insects, he preys on young birds, eggs, mice and other creatures. When he is dealing with one of his larger captures he usually impales it on a thorn and then tears it to pieces. Sometimes several creatures may be found thus impaled on one bush, and such groups are known as the shrike's "larder," the assumption being that the bird deliberately stores food and returns to eat it when he feels inclined. This is doubtful. The hunting instinct is strong in all wild birds and while food is plentiful there is no need to store it. As the red-backed shrike is only a summer visitor, he is never likely to be faced with starvation while he is here. It is possible that the female may visit the larder at intervals while she is brooding, or that some birds capture more than they can eat, or that some are epicures and devour only special portions of their victims. Or, again, it may be that after a pair have started feeding their young the nest has been destroyed and that the instinct for collecting more food than they themselves require, having been set in motion, has continued to actuate them for some time after the need for it has been suddenly removed, and the larder is the result. Whatever the explanation may be, the habit seems to call for closer investigation than it has been given hitherto.

As he so frequently attacks and devours larger and tougher creatures than insects, the shrike's beak has become modified to suit his habits. It is stouter than that of the ordinary insect-eater, and it has a sharp hooked tip which must be a serviceable weapon for tearing and rending skin and sinew.

More profound modifications of form to suit special habits are to be seen in the swallow. This bird spends most of his day on the wing hawking insects which are too small to be caught nimbly one by one. Consequently his beak is short and his gape wide so that, as he sweeps through a group of his victims, he may take a whole mouthful at a time, after the manner of the whale. Further, his body has been so moulded as to offer the least possible resistance to the air and his wings have been cut long and narrow to give the greatest possible speed.

Quite another type of insect-eater is the tree-creeper. His habit is to search for minute insects in the crannies of bark on the trunks and larger branches of trees, so his beak has been lengthened and curved downward to a fine needle-like point. As a rule he begins at the foot of the trunk and creeps up in a series of little jerks, sometimes going perpendicularly but frequently spirally, until he reaches the larger branches. Along these he proceeds, usually on the under side where he must find much better hunting than he could on the more frequented upper side. To aid him in this peculiar practice his feet are large so that they may take a firm grip of the bark, and the central feathers of his tail are stiff and give him additional support when they are pressed against the tree.

In this last feature he resembles the woodpeckers though he is not related to them. They are, of course, climbers and their feet are specially designed to suit their craft, two toes being placed in front and two behind. They have a long, strong, sharp beak with which they can chisel deep holes in the wood of a tree that is beginning to decay. With this tool they prize off portions of the bark and, digging into the wood, extract the grubs that are feeding on its fibres. The actual capture of the lurking grub, however, is not done with

the tip of the beak. When its burrow has been exposed, the bird thrusts into it his long whip-like tongue, which is covered with a viscid fluid, and licks the insect into his mouth.

When you hear a repeated tap-tap-tapping among the trees you may jump to the conclusion that you are listening to the woodpecker, but you cannot be sure until you actually see the bird. It may be the nuthatch, another expert climber, which belongs not to the woodpecker family but to the great passerine tribe which includes the sparrow and other finches, the thrushes, the warblers, the crows and others. This active little bird has not developed a stiff tail nor any remarkable adaptation of toes to aid him in his work, yet he is, if possible, a more highly skilled climber than either the tree-creeper or the woodpecker. With equal facility he will run up or down a tree, and walk round a horizontal branch or sideways along it, and I have been so impressed with the ease of his performance that I have often watched him in anticipation of seeing him running backwards. On these excursions he hunts for insects, but, as his name implies, he is capable of breaking the shell of a nut and he may do so either to secure an insect that is hidden within or to eat the kernel. He carries a nut or an acorn to a horizontal branch of a tree where he fixes it in a cleft of the bark and then, standing with his head immediately above it, hammers it with his straight, strong beak until he smashes the shell.

The tap-tap-tapping may be caused by yet another bird. It may be due to the operations of a tit. I was once attracted by the sound almost overhead and, looking up, I saw a blue tit busily digging a hole in a rotten branch of an oak. Large flakes of the soft fibre floated to the ground and I found that one of them was covered with the eggs of some insect.

All these birds have one type of beak, a simple pair of forceps with which they can seize their soft food. Seed-eating birds require a special type of beak for their work. Partridges and pigeons swallow seeds whole so a more or less normal beak serves their purpose, but the sparrow and other finches deal with seeds in a different way. The canary, as every one knows who has ever watched one feeding, cracks its seeds, swallows the kernels and throws away the shells. This is the method of the finch family generally and consequently these birds have developed a short, stout, horny, curved beak which is a very efficient nut-cracker. A useful comparison may be made between the beak of the house sparrow and that of the hedge sparrow. The latter bird is not a sparrow at all and not even a finch. He is related to the robin and, like him, eats insect food, so his beak is thin and straight and may be described as a pair of fine forceps as distinguished from the nut-crackers of the house sparrow. The name hedge sparrow is therefore unsatisfactory, and hedge accentor, which some writers have tried to substitute for it, is unacceptable. In some parts of the country the bird is known as the dunnock, and as this is a pleasing word and descriptive, it would be an advantage if it could be adopted generally.

Seeds differ in size and hardness and consequently we find that the beaks and habits of the seed-eating birds vary accordingly. The goldfinch is specially fond of thistle seeds, and one of the prettiest sights of the countryside is to see him at work on the thistle heads, now clinging to one and robbing it of its treasure, now flitting to another with a flash of his golden wing bars. The linnet eats dandelion seeds among others and he attacks the heads just when they have regained their upright position and are ready to open and spread their downy clocks, which is just when they

are ripe. He alights on the stalk about an inch below the head, and his weight bends it down to the ground where he is able to break through the protecting fence of bracts and feast on the store within. Flocks of redpolls may often be seen in winter feeding on the tiny seeds of birch, and siskins on those of the alder.

Seeds that are hidden in berries are so well protected as to be in little danger of attack from birds. The juicy coat seems to be a puzzle to the seed-eater. On the other hand, the hip and the haw, both of which have comparatively dry flesh, are commonly burgled by greenfinch and hawfinch.

If you cut a haw open you will find that it contains a single round stone. This is too large and hard to be cracked by most of our seed-eating birds, but the hawfinch has a thick and powerful bill which is specially constructed to deal with such a difficulty, for it has two broad plates inside between which the seed can be firmly held and broken. It looks a very clumsy instrument but the bird uses it with marvellous skill. He pierces a neat round hole in one side of the fruit and, having extracted the seed through this, he throws the skin and pulp away. Then he splits the stone in half, drops the broken shells and eats the kernel. You may often find evidence of this operation on the ground where a well-laden hawthorn bush overhangs a road or footpath.

The hawfinch also eats the hip which is the fruit of the wild rose, but the greenfinch feeds on it regularly in winter, its smaller and softer seeds presenting no difficulties to his lighter bill. Both birds cut the skin on the side that is uppermost and rifle its contents seed by seed, but at the same time they take the sweet pulp, and, if they are not disturbed, they leave nothing but the transparent skin

hanging on the twig like a piece of oiled silk. Their practice is to split the seeds and eat the kernels only, but perhaps the flavour of the pulp induces them to swallow some of them whole. At any rate, the rose flourishes and spreads, so many of its seeds must be distributed undamaged. Fieldfares and other members of the thrush tribe also sometimes eat hips and no doubt they help in the good work. Often, however, the greenfinch is interrupted in a meal and leaves a half empty hip from which, when it dries, the seeds will be jolted out by the wind.

Blackbirds and thrushes swallow haws whole, but they seem never to trouble about this fruit until after a night's frost. It may be that, like Brussels sprouts, the haws have a better flavour after they have been frosted, but I am more inclined to think that the reason is because the cold nights drive the worms down so far in their burrows as to be out of reach. Besides, the redwing, which winters here in flocks, feeds to a large extent on haws during its stay and begins immediately on its arrival, towards the end of September, while the weather is still quite mild.

There are two great annual festivals among birds. They come round almost as regularly as Christmas and much more regularly than Easter. The first is the Rowan Feast and the second the Yew Feast. There are many other wild fruits from which the birds might choose, but they never make a feast of any but these two. They eat some at intervals, others they avoid until they are forced to take them by starvation. But the moment the rowan berries are ripe, in September or October according to the district, the thrushes and blackbirds flock to the trees and gorge themselves on the luscious fruit. They tear at the bunches greedily and if by chance they drop a bunch they make no attempt to pick it up, but at once attack the next; and

except for very brief intervals they never stop, unless night intervenes, until they have stripped the rowan trees bare.

The brief intervals come when they have eaten so much that they cannot accommodate any more. Then they fly down to the ground, empty their crops and return to gorge again. This happens more frequently and is therefore more noticeable when they are feeding on yew berries, because that fruit contains a large stone. The birds never pause, before they swallow it, to enjoy, as we do, the luxury of breaking the fruit on the palate and squeezing the delicious juice to the last drop. They bolt each berry whole, and when the flesh has been rubbed off and passed on for digestion, they eject the clean stone. This happens whether they have overeaten or not, so when at a feast they find the crop too full and their appetite still tempted by the sight of thousands of rich red morsels, they naturally turn to rid themselves of all indigestible matter, and if, in the process, some of the more recently swallowed berries are wasted, why, there are plenty more where they came from. The birds are quite human in their wastefulness.

From the point of view of the tree, it does not matter whether the fruit is wasted or not so long as the seeds have been transported intact to some spot where they may have a good chance of making a satisfactory start in life. This is the sole reason for the production of the fruit. We are too apt to think that it is provided for the benefit of the birds, to help them through the winter by saving them from starvation when their natural food fails. The truth is much more wonderful than that. As blackbirds and thrushes have wings they could easily migrate to a more genial climate if they wished at the approach of winter, as so many other species do. But the wild fruit harvest saves them that trouble, and in return they unconsciously render

the plants a valuable service by distributing the seeds. It is payment they receive from the plant for performing this important work, and so is an example of a primitive form of commerce. But the most remarkable feature of this co-operation is that the birds that take part in it are not seed lovers but worm and insect eaters. And it is not hunger that drives these birds to the two great annual berry feasts, for both of them take place long before winter arrives and while their ordinary food is still plentiful, so we must conclude that, like ourselves, they succumb to the delights of the eye and the palate.

As I have already said some fruits are not popular with birds. I have noticed that the privet berries are often left to rot where they grow. It is easy to assume that this is because they are not sufficiently conspicuous, but the holly makes the finest display of all our berry-bearing trees, and there are always plenty of holly berries at Christmas except in bad seasons. It would seem that some berries are eaten by birds only under stress, which is another way of saying that even the best advertisement will not sell an indifferent article.

Between such peaceful traders and the predatory tribes of bird there is as marked a difference in habit and equipment as there is between a merchantman and a man-o'-war. The bird of prey has to go a-hunting for his meals. He is large in comparison with his usual game, and his methods of hunting and of attack vary with his species or, in other words, in accordance with the types of creature on which he preys and their defensive instincts. They may be as well equipped for defence as he is for attack, for though they may not turn on him and fight for their lives, they may be protected by the resemblance of their coats to the colours of their surroundings, by the instinctive habit of "freezing"

the moment they realise that they are in danger, by an equally instinctive knowledge that there is safety in cover or by the gift of speed. He must therefore be able to take them by surprise, or to pursue and overhaul them, and when he has done so he must be able to seize and hold them securely lest by struggling they should escape, to kill them quickly and then to cut their bodies into pieces of a suitable size for swallowing. Accordingly his wings are designed for speed, his feet are powerful and are provided with formidable sharp talons for gripping and killing, and his strong beak is hooked at the tip for tearing and dismembering his victims.

Any day while we are walking through the fields or near them we are almost sure to see somewhere a large brown bird hovering over them. For a few moments its wings may vibrate rapidly, then they may be almost still for a little, or the bird may depress its tail as if it were applying a brake. Presently it will fly to another part of the field and hover there, then to the next field and so on till it passes out of sight. If we are lucky we may see it suddenly drop to the ground. In that event we may be sure that it has seen some possible prey and has descended to capture it; but it is surprising how far one of these birds has to travel and how often it has to hover, or in other words, how hard it has to work before it succeeds in obtaining a meal.

This hovering bird is the kestrel which is our commonest bird of prey. It feeds chiefly on field mice and on beetles and it hunts for these by hovering high over the fields. From this we may gather what a wonderfully keen sight it must have. Think how much we should be able to see of the movements of mice among the long grass of the meadows if we were looking down from the top of a tower

a hundred feet high or more. We should see nothing of them, and we should be still less likely to notice a beetle at that distance. Yet the sharp eyes of the kestrel must be able to see both. No doubt he judges as often as not by signs, such as certain movements of the grass which are different from those caused by the action of the wind. But even then he has to make sure before he troubles to come down, for it would be a great waste of time if he had to descend to investigate every such movement he might notice. Often the mice he sees may be just on the point of vanishing into a burrow or may just be scurrying from one opening of a burrow to another. The kestrel has to satisfy himself that the mouse has come out to feed, and that it will be so engaged for long enough to enable him to swoop down and capture it. Frequently he hesitates as if he were uncertain whether to descend or not, and presently he turns away and flies off, having decided that his chances of securing a meal were too small.

Whenever he pauses to hover he always turns his head in the same direction, and this is invariably the direction from which the wind is blowing. He has to face the wind, however light it may be, in order that he may remain stationary in the air. Unless he were to do so he would drift, and would never be able to stop long enough over one spot to make reliable observations. But by facing the wind and flying against it at just the speed at which it is blowing, he is able to keep steady in the air as if he were hanging there on a string, neither moving forward nor drifting backward ; for if the wind should begin to gain the mastery he can easily overcome the drift by a few rapid wing-beats, and if he should thus give himself too great an impetus, he can reduce his speed by depressing his tail.

It will be only by a very wonderful chance that you will

ever observe him actually capturing his prey, but when he does swoop down on a mouse or a beetle, he grips it, not in his beak as most other birds seize their victims, but in his feet. This is the habit of all our birds of prey. They also carry food in this manner. The captive is most probably killed instantaneously, but if it is not, it is promptly dispatched after capture. Then, held in the feet either on the ground or on a perch, it is dismembered and eaten piecemeal.

The kestrel sometimes kills small birds if he sees a good chance and if mice and beetles happen to be scarce for the time being. But their deadliest enemy is the sparrowhawk, which is our next commonest bird of prey.

Small birds take little notice of the kestrel, either because they know that he is not one of their regular enemies, or because so long as they see him hovering high in the air, they feel sure that they will have plenty of time to scurry into cover if he swoops down at them. And, indeed, they are such restless creatures and so well able to take care of themselves that the sparrowhawk has to adopt a special mode of attack in order to catch them.

He is careful not to show himself openly as the kestrel does, and flies secretly along the hedgerows or by the sides of the woods where small birds are usually plentiful. He moves swiftly and his eyes are as keenly on the watch for possible prey as are the kestrel's. If he were to fly across an open space he would immediately be seen by every bird within sight, but by coming suddenly round a bend or over the top of a hedge, he often takes a number of them by surprise. In a moment he fixes his eye on one and darts towards it like an arrow. If he is successful he grabs the victim in his feet and kills it, and then alights on the ground and eats it. In the process he tears off many of its body

feathers, and these we frequently see lying scattered round the scene of his feast.

When the sparrowhawk does cross an open field, his caution is evinced by the fact that he flies low and rises to a perch on the other side. This action is so characteristic that it is often a first indication to a practised eye that there is a sparrowhawk in the neighbourhood.

The peregrine falcon, another of our birds of prey, makes his home on high sea cliffs and mountain precipices. He is larger than the sparrowhawk and is a handsome and noble hunter. He preys on all kinds of birds, large species like crows, ducks, gulls, grouse, and so on, and even other birds of prey, but he seems to have a predilection for pigeons. In order to capture such prizes he has developed a magnificent, spectacular and eminently sportsmanlike method of attack. He never resorts to surprise which is the invariable practice of the sparrowhawk. He pursues his intended prey openly, and being tremendously swift of wing, he overtakes it and then "strikes."

This striking of the peregrine is a wonderful and impressive sight. The hunter prepares for it by rising above the fleeing bird, and when he reaches a suitable position he "stoops." That means that he half closes his wings and shoots down like a bolt. If you chance to be near when this happens you will hear a loud swish caused by the speed at which his body rushes through the air. You will think for a moment that he is going to strike his victim with his head, but if he were to do that he would most probably break his own neck.

Just a second or so before he actually reaches the doomed bird he raises his head and, passing over the fugitive, he strikes it with his spurs, driving their sharp claws into its back. The blow and the wound kill the bird instantaneously

Peregrine Falcon.

and it drops to the ground, and the hunter passes on, carried by the impetus of his plunge for some little distance before he can check himself. Then he returns and retrieves his kill and carries it to the edge of the cliff where he tears it up and devours it.

The merlin is our smallest bird of prey; he is only about ten inches long, which is just about the size of a blackbird. He lives on barren moorlands where he nests on the ground and preys upon meadow pipits and skylarks. As there is no cover on the moorlands from which he could make a surprise attack, he has to depend entirely on speed. On the other hand, there is little or no cover into which his small quarry can escape as the birds of the hedgerow can when they are attacked by the sparrowhawk. And again, the meadow pipit and the skylark have not the fast and straight flight of a pigeon or a starling. When they are attacked they dodge hither and thither in their endeavour to escape, and the merlin follows close on their heels, turning and twisting as rapidly as they do until he has tired them out.

Formerly hawks and owls were grouped together in one family, but though the owls are undoubtedly birds of prey, they are not related to the hawks. They are such interesting birds that it is a great pity their habit of flying by night makes them so difficult to identify and study. Sometimes they do come out in daylight. I have myself on several occasions seen the barn owl abroad in the middle of the day, but this has always been in winter or early spring and, though the days have been fine, there has not been bright sunshine. It is a startling and thrilling sight to see this large, strange white bird floating silently along only a few feet from the ground and at times hovering almost overhead. Some observers have suggested that this happens when the owl has been startled from its roost. In all the

instances I have in mind the owl has been busy hunting and has not been flying hurriedly, as it would have been had it been disturbed at its usual perch and been seeking another. Instead, it has been floating along leisurely, hovering here and there over spots where mice might be lurking, now and then settling on a fence or low branch to look about it, and passing from point to point with the certainty and purpose of a hunter that knows the landmarks well and the places where food is generally plentiful. I have always concluded that it had come out to hunt because it had not been as successful as usual the night before.

Once the bird was hunting just behind a sea wall on a wide Essex marsh and at least half a mile from the nearest roost. It was so absorbed in its work that it ignored myself and my companion though several times it passed us almost within touching distance. That it noticed us was obvious, for as it came sailing along a foot or two above the grass, it rose abruptly when it neared us, sailed over our heads and dropped immediately to the two-foot level again.

The owl's method of hunting is similar to the kestrel's, except that he examines the ground from a closer range. Like the kestrel, he hovers frequently when some movement in the grass attracts his attention, but only for a few seconds at a time, and I have not noticed that, when he does so, he troubles about the direction of the wind. At night he skims along close to the ground and goes up and down a field with the regularity of a ploughman. His plumage is so soft that his flight is startlingly silent, so he must pounce on his victims, which consist almost entirely of rats and mice, before they are aware of his presence. Like the hawks, he seizes his prey with his feet, but unlike them he swallows it whole, head first.

Now, though the owl swallows his prey whole, he is

unable to digest the complete animal. Afterwards therefore he throws up the indigestible parts, that is, the skin and the bones. These are tightly packed together into what are termed pellets, but the word "pellet" suggests something much too tiny for those curious objects. They are more like plugs of grey felt an inch or more long and about as thick as a man's finger. These pellets are ejected at the roosting place, and as owls inhabit the same spot for years, you may find great quantities of them wherever a pair have nested. Once I came upon a large hollow tree which must have been the home of many generations of owls, for at the bottom of the hollow there was the usual collection of pellets, but they rested on a bed which was a solid mass of small bones and crumbled skins and about eighteen inches deep.

Many other birds whose feeding involves the swallowing of indigestible substances, have this habit of ejecting pellets. The pellet of the heron is a large object; it may be as much as three inches long, two inches wide and one inch thick. All the birds of prey produce pellets and so even does the robin. It follows that by examining these ejectamenta, it is possible to gain valuable information as to the food of birds whose habits we are unable to observe intimately. I have seen a pellet of a tawny owl which consisted entirely of the wing-cases of beetles, though the greater part of the same bird's refuse was composed of mouse skins and bones. I have also seen pellets of the little owl made up entirely of beetle remains and others containing only the feathers and bones of small birds. This engaging alien is a daylight hunter and as he is increasing at a great rate and spreading to all parts of the country, you may expect to see him any day sitting on a telegraph wire or a fence and blinking at you in innocent surprise.

The owl's habit of swallowing his victims whole makes one wonder why he has a hooked beak. The beak suggests that he is related to the hawks, and his practice of seizing his victims with his feet would seem to confirm this. But his feet are so peculiar that they suggest relationship to quite another group of birds. When he perches the owl's toes are arranged two in front and two behind. In this respect his feet resemble those of the nightjar. It is now believed that the owls belong to the same family as the nightjar, and that their resemblance to the hawks is due to the fact that the two types have developed similar habits of hunting.

In some parts of the country the nightjar is actually known as the fern owl. Like the owls he sleeps by day and comes out to hawk at dusk. Moths and beetles are his prey and his strange jarring note may be heard in the woods, especially where bracken abounds just about the time when the first of the night moths is seen in flight. His manner of hawking is similar to that of the owl except that, as his prey are winged, he works at a slightly higher level. He flits silently to and fro across the open spaces of the woodlands, pausing and hovering momentarily as he makes a capture and then proceeding. When he alights on a branch, he sits on it lengthwise instead of across it as other perching birds do.

Besides the owls and the hawks, a number of other birds are characterised by some striking convergence of form or feature as the result of adopting similar methods of hunting. The shrike is not, strictly speaking, a bird of prey, but a passerine bird which feeds on large insects, young birds and even mice, which it is necessary for him to dismember before he can make a meal, and consequently he has developed a hawk-like hooked beak. A more familiar

example of this parallel physical development is the remarkable resemblance between the swift and the swallow. These birds live by hunting insects all day long on the wing. The conditions of their work demand certain qualities which they both possess in a high degree, and their features have been modified accordingly. So closely do these birds approximate to each other in the shape of the body, the form of the head, beak and mouth, the cut of the wings, the forking of the tail and the habit of nesting on human dwellings, that until only a few years ago the swift was classed as a member of the swallow family. Now we know that it is not in any way related to the swallow, but is probably a not very remote cousin of the nightjar and the owls. When I am watching the cormorant and the shag, the great crested grebe, one of the divers, a saw-billed duck, or a guillemot at work I am always impressed by the general likeness of each to the others. These five different kinds of bird belong to separate families, yet because they all live by hunting fish under water, they have developed in common certain physical characteristics which might quite excusably suggest consanguinity to a superficial observer. Similar working conditions tend to mould different creatures to a type.

As feeding habits are not instinctive among birds, it is not surprising to learn that they are varied according to circumstances. The chaffinch, for example, is a seed-eater, but it is not uncommon in spring for a chaffinch to dash out from a tree in pursuit of a moth or a butterfly. I have observed both the blue tit and the goldcrest chase insects in a similar way, and have frequently seen the willow warbler hovering like a humming bird head on to the tip of a twig and snapping at minute creatures that were flying there. Once I saw a pied wagtail hovering over a cornfield.

Presently it flew off, but in another minute it was back in the same spot hovering again, and it repeated this manœuvre several times. I concluded that it was feeding young and that it was able to capture a plentiful supply of small insects by thus hovering where they were swarming, instead of having to run after each one separately according to its custom. In the great drought of 1921 I watched a family of missel thrushes hunting insects round the tree-tops. The ground was then baked so hard that it must have been impossible for them to obtain worms.

The kingfisher plunges from a perch to capture his prey, but where a suitable branch or stake is not available he will hover over the water. I have seen him do this at varying heights up to about fifteen or twenty feet from the surface, and sometimes he has remained suspended thus with rapidly vibrating wings for a considerable portion of a minute. Apparently he has not discovered the value of the wind to a hovering bird, for unlike the kestrel, he seems unable to hang in the air motionless. He holds his body almost upright and keeps himself more or less stationary by overcoming the power of gravity with his fast-beating wings.

The green woodpecker has made a remarkable and quite decisive change in his habits. As a woodpecker he is a bird of the woodlands. There he can make a living by pecking for insects in decaying trees, and he pecks a hole in a tree for his nest. But he has found that pecking wood is a slow and laborious process compared with sitting quietly on an ant's nest and licking up the ants. So, while he retains his ancestral habits, he has become very much of a ground-haunting bird. There are not two kinds of green woodpecker, one that remains solely a woodpecker and the other a sub-species, which through some accidental variation in structure, has been enabled to feed luxuriously on ant-hills.

The whole race has made the change which is clearly a matter of choice. Possibly it has been brought about by the thinning of our woodlands and a consequent scarcity of insect food among the remaining trees.

Remarkable variations of its feeding habits are often shown by the starling. This bird feeds on the ground, but in early spring before the coming of the swallows and in late autumn after their departure, he may quite commonly be seen hawking for insects in the air, and probably many of the so-called early swallows are starlings in disguise. One beautiful morning in October, 1920, I watched a whole flock of starlings thus engaged over a field where swallows and swifts had hunted throughout the summer. At first they were industriously feeding on the ground, but their activities seemed to startle some attractive insect from among the long grass, probably cranefly, and now and again a bird would leap up to capture a fugitive. If he failed in this first attempt he might try a short flight, and, having succeeded in this, he might go off in pursuit of another insect that had almost made good its escape. Several began in this way, then suddenly the whole flock was in the air wheeling, dashing and swooping, and evidently enjoying the fun of the chase. Each bird acted independently and threaded in and out among the rest, so that there was a maze of skimming forms overhead. Thus the recognised law of the flock, that common action must be observed in the air, was for the time being, as it were, thrown to the winds.

I have also seen a large flock of starlings, all apparently young birds, feeding among the branches of oak trees on the pupæ of the green tortrix moth, the caterpillars of which had a few weeks earlier destroyed the whole of the foliage.

CHAPTER NINE

WATER BIRDS AT WORK

When birds first sought a living in water, they had a set of new problems to face, and they have solved these in practical ways according to the food they have chosen. The securing of each type of food has necessitated the formation of peculiar habits and in developing these to the pitch of highly skilled trades, they have evolved remarkable modifications of their forms, which are not only perfectly adapted to the particular purpose for which they are intended, but are so beautifully contrived that, though in some instances they have become extreme and grotesque, they are never a handicap to their owners.

The kingfisher and the dipper are land birds which obtain their living in the water and each has developed a method of hunting peculiar to itself. The kingfisher sits on a perch

that overhangs pond or stream and when a fish swims within his ken he flutters down and plunges to capture it. He returns to his seat after each dive, carrying his fish crosswise in his bill. He may then beat it on the stick to kill it and that done, he works it round in his beak till he is holding it lengthwise and swallows it head first.

The dipper, which is a cousin of the common wren, lives on water insects for which he hunts in clear, fast-running streams. He is not gifted with webbed feet, yet he is a good swimmer and pursues and searches for his prey under water. He enters the stream either by walking in over his head or by plunging from a rock, and once under, he swims with his wings, keeping his feet steady or using them only for steering.

In the rail family we have several species in which we can trace a transition from a bird of the dry land to a bird that spends most of its life in the water. The corncrake, a summer visitor, lives among growing hay and meadow grass. He is often heard but seldom seen, for his custom is to run through the long stems rather than to fly from point to point. The water rail is also a skulker, but he prefers damp situations and feeds and nests in dense reed beds on swampy ground. The waterhen, or moorhen as he is more frequently called, is not so secretive. He comes out boldly to feed on the meadows that border lake, pond or stream and swims near the bank or wherever water weeds are growing at the surface. I have often seen him climbing among the branches of bushes overhanging a pond. He is a black bird with white vertical markings on his sides and white under his tail, but his distinguishing badge is a large red shield on his forehead. Wherever he may be when he is alarmed, his tendency is always to make for the bank, and there he hides as effectively as if he had disap-

peared into a burrow. He swims in a curious jerky way, as if he were simply walking in the water.

His cousin the coot is a larger bird and is all black except for the shield on his forehead, which is white. He is exclusively a water bird and feeds chiefly on water weeds which he obtains by diving. When he is alarmed he swims into deep water or to the farther side of the lake, but he may take advantage of shelter if he should happen to be near a reed bed.

The influence of these different habits is shown by the feet of the water hen and the coot. The former has feet like those of a land bird except that the toes are unusually long and have a slight ridge of skin along each side of them. The coot has broad lobes of leathery skin on both sides of each toe between the joints; in other words each joint of its toes is provided with a pair of wings or planes.

The grebes also have lobed toes, but in their case the flaps of skin are continuous along the whole length of the toe, and the claw is flattened out into a broad nail which must increase the utility of the foot as a paddle. All the members of this family are expert swimmers and divers, but only two of them are common in this country, the little grebe or dabchick and the great crested grebe. As these birds may often be seen at work on the same waters as the coot and the water hen, I have amused myself many times by comparing their diving powers. One obvious distinction between the coot and the grebes is that the coot comes up about the spot at which it goes down, whereas the grebes travel under water and appear disconcertingly in various quarters, and at varying distances from the point at which they dive. This indicates a difference in feeding. As can easily be observed from the material which he carries in his bill when he comes up after each dive, the coot feeds on

water weeds that grow at the bottom of the pond. All he need do therefore is to dive plump to the bottom and, as soon as he has secured his prize, bob up again. The grebes prey on fish, frogs and other water creatures which they must seek and pursue after they dive, so their course may change more than once before they come up to breathe or to dispose of a capture. When a grebe notices a human being on the bank he may go on with his work without showing any sign of alarm, but after each dive he will come to the surface farther and farther away from the intruder, until he judges that he has put a safe distance between himself and danger, and he will avoid the neighbourhood of that bank until the enemy has withdrawn. In similar circumstances the coot will retire also. He may dive frequently as he goes, but he swims on the surface.

The duration of the coot's dive is quite short, as a rule not more than eight or ten seconds. To me it always seems to be much longer until I measure it with my watch. It is strange how deceptive time can be. A second seems an age when you are waiting for anything, but half an hour passes like a flash when you are taking five minutes longer in bed of a morning. I used to believe that a coot remained under water for at least half a minute, and I was astonished when my watch proved to me that the period seldom exceeded twelve seconds and was often as short as six. The coot is a much larger bird than the dabchick but he has the simpler job of the two. The dabchick's dive may last only ten seconds, but I have timed some that have extended to more than twenty seconds. This bird has the power of remaining under water for many minutes and does so when alarmed. He can keep his body submerged just below the surface, and by protruding his beak can breathe and lie there comfortably as long as may be necessary. Now and then he may

pop up his head to reconnoitre, but if danger seems to be still imminent, he will sink again for another period. So in his case care has to be taken to measure only true dives. The much larger great crested grebe can remain under water for about a minute, though most of the dives of the birds I have tested have been between twenty and thirty seconds. It is possible that some individuals at times exceed the minute. Other species can. I have seen both guillemot and cormorant remain below for just over a minute; but I have not timed these or any other diving bird systematically. Mr. Dewar, who has done so, records a guillemot's dive of sixty-eight seconds, a diver's of the same duration and a cormorant's of seventy-one. My own experiments have been made casually while I have been resting, but I have found them an amusing pastime, and I think that such tests offer a fruitful field of research for any one with time, patience and a stop-watch at his disposal. In timing these birds, however, especially the larger ones which can travel considerable distances under water and appear in unexpected quarters, it is necessary to be satisfied that a long dive is not really two short dives combined, the bird having come up for a second or two and gone down again without having been noticed.

Certain species of diving duck may often be observed at work on the same waters as the coot and the grebes, especially in winter. The commonest is the tufted duck, a comparatively small black bird with a large white patch on each side. The pochard, which has a red head and neck and a silvery back, is also fairly common. Sometimes these two species visit our lakes and reservoirs in large numbers. The golden-eye, a black duck with a conspicuous white patch on each cheek, comes not uncommonly in ones, twos or small parties. In my experience the dives of these species

last for about ten to twenty seconds, but sometimes for more than half a minute. Whether there is any difference in their powers of endurance could only be ascertained by comparing a large number of reliable records.

Ducks are usually divided into two classes, the surface-feeding ducks and the diving ducks. The common domestic duck is the type of the former class. Her method of working is to swim along quietly by the edge of the pond and now and then to thrust her head under water. When she raises it again there is mud trickling from the sides of her bill. What she does is to search among the mud at the bottom of the pond for anything eatable whether vegetable or animal, and when she finds something, she allows the mud to drain away through channels formed by a number of ridges along the inside edges of the upper and lower parts of her bill, and then swallows the morsel which meanwhile she has held with her tongue. Where the water is deeper she plunges not only her head but also her whole neck and shoulders under water, and tips her tail up in the air in order to enable her to reach the mud, but she seldom, if ever, dives. For this method of feeding her broad, flat bill is eminently suited.

The domestic duck is just a variety of the mallard or common wild duck. Other surface-feeders are teal, widgeon, gadwall, garganey, pintail and shoveller, each of which has a strikingly beautiful and distinctive plumage.

The last species has the bill modified in a very remarkable way. The upper mandible is broadened at the tip to such an extent that it looks heavy and grotesque. It is from this feature that the bird takes its name, for it gives the bill the appearance of an upturned shovel. Along the inside edges of the mandibles there is a row of bars like very thin whalebone. They are set so close together that they resemble

a fine comb. Their purpose is to act as a sieve. While he is feeding, the bird sucks in a stream of water through the broad shovel tip and expels it through the sieve on each side. The bars allow the water to pass but retain any solid matter that may be suspended in it, including vast numbers of minute creatures, and on this residue the shoveller feeds. He may therefore frequently be seen swimming slowly with the tip of his bill submerged. He is not averse from larger prey, however, and sometimes dashes rapidly hither and thither to capture water insects as they appear on the surface.

Like the coot, the tufted duck and the pochard come up close to the spot at which they dive. When they plunge they go in a more or less direct line to the bottom, I should say at about an angle of forty-five degrees, and, while keeping themselves down by paddling with their feet, choose a juicy piece of plant that is growing there and snatch it off. Then they just raise the head and stop paddling and in a moment they bound to the surface again. The whole process can be easily observed from the bridge across the lake in St. James's Park, London.

As the tufted duck swims before you, you will observe that its body is low in the water and that its tail is trailed on or under the surface. All diving ducks swim and trail their tails in a similar manner, while the surface-feeders carry the tail well clear of the water. This peculiarity of the diving ducks seems to have some connection with their working habits, for I have noticed that when they are not actively feeding, the tail sometimes rises a little above the surface. Combined with the manner in which the head is carried, it gives a distinctive sporting appearance to the bird, which enables one in time to pick out diving ducks in a mixed flock, even when colours are not visible.

The division of ducks into surface-feeders and diving ducks is not sufficient. The goosander, the red-breasted

merganser and the smew are diving ducks, but they are so distinct from the others that they ought always to be thought of in a class by themselves. They are fish-eating ducks, and so, like the grebes, they travel under water when they dive, and their reappearances are always unexpected and at disconcertingly divergent points. They have a long thin neck and a narrow bill like a grebe's, and the mandibles are armed on each side with a row of saw-like teeth which probably help to hold the slippery victims when they are caught, though in considering this we must bear in mind that other fish-eating birds are even more successful without them. From this peculiarity these ducks are known as sawbills. The teeth are not true teeth, but simply sharp serrations of the edges of the mandibles; no doubt they are special adaptations of the ridges on the bill of the common duck.

Several species of duck are strictly denizens of the sea, scaup, scoter, velvet scoter, long-tailed duck and eider. These birds feed on shell-fish which they obtain by diving. Indeed, the scaup has been named from its habitual resorts, scaup being an old word for mussel-bed. As they work at greater depths than the fresh-water diving ducks, the average duration of their dives is probably longer than that of the birds we can watch so easily on lake and reservoir, but it is difficult to keep them under observation for any length of time, so reliable records of their operations are hard to obtain.

That handsome bird, the sheldrake, picks up his living on the mudflats at low tide. His bold black and white plumage makes him the most conspicuous bird of the mudflats, but he is by no means the most interesting. The mudflats are the peculiar territory of the waders. At all seasons we may see some of these birds there, but from

midsummer to the end of April they resort to the more secluded parts of the foreshore in thousands. We may find curlew, snipe and redshank on the moors and marshes in spring and summer, and there we may study their courtship and nesting habits, but unless we are fortunate we shall never have the satisfaction of observing their methods of feeding. On the mudflats it is possible to watch them at work from the time the tide begins to ebb until the next tide reaches high-water mark.

As they feed very largely while wading in shallow water at the edge of river or sea, or in pools, or while walking about on the shore, it is easy to watch them with the aid of field-glasses, if you can manage to get behind some cover where you can remain unseen by them. They themselves have no cover as they can find their food only in the open, so to any one looking across the sands, every movement they make is visible. Because of this they have to be exceedingly wary, and they will see you approaching long before you are near enough to harm them, and will fly off away across the wastes, uttering their shrill bell-like cries which alarm all the birds within a wide radius, and so as you advance you find the shore deserted. But if you can fix on a part of the shore that is much frequented by the birds and approach this behind cover, you may watch them all day without disturbing them, so long as you refrain from showing yourself too much or moving in such a way as to attract their attention.

The most conspicuous of all the birds that wade on the flats is the heron, because of his large size and his colour, but still more because of his lengthy legs and neck. He is a wading bird, but not a member of the Wader family. He is not a cousin to the curlew, snipe and plover, though he resembles them in his manner of feeding and in his general

appearance. To most people who have seen him he seems to spend the greater part of his time standing like a statue up to the knees in water. That is because they have allowed him to become aware of their presence. He is the most wary of birds, and he can hear the slightest sound and notice the most cautious movement from a great distance. To the enthusiastic bird lover who can creep up to windward of him and watch him at close quarters from behind cover, he becomes much more interesting. He still stands like a statue for part of his time, but while he is doing so his eyes and ears are keenly on the alert for the movements of prey and the approach of enemies. Presently his long neck stretches forward and his attention becomes riveted on something that is apparently swimming about in the water. Again he waits, watching intently and ready to pounce, then suddenly he plunges his head into the water and withdraws it immediately with a struggling fish in his bill. At once he becomes erect and like a statue again, and he may stand in the same spot for a long time, repeating the thrusts and plunges of his head as prey swim within his reach. He makes no attempt to pursue, but if, after he has waited a reasonable time, nothing suitable comes within his range, he will stalk majestically over to another pool or a more likely part of the stream, or with a few flaps of his great wings he will pass quickly up or down the bank, or cross to the other side. I have watched herons at work, however, in a shallow lake which was well stocked with fish. They were wading about actively hither and thither, and had all the appearance of being intensely absorbed in their occupation. Fish forms only part of their food. They will eat any creature that is small enough for them to swallow, and accordingly they will feed in a ditch, or pick up frogs in a damp field.

The redshank, a much smaller bird and a true Wader, employs quite different tactics, and he is so quick and so active that he is one of the most interesting of the shore birds to watch. You may see him often stepping about quietly on the mud picking up something here and there, but he is at his best and I am sure he is happiest when he wades into the stream or a large pool. For there he feeds on little creatures that dart about in the shallow water, and the moment he enters their sphere his whole character changes. He wades forward energetically, always in one direction, turning his head rapidly from side to side as he goes, and dabbing his long bill into the water now here now there to capture his prey, but never, so far as I have seen, plunging his whole head under like the heron. Suddenly he will turn right round, as quickly as an owl turns its head, and capture some creature that had been bold enough to dart between his legs, then round again and on as before. He is so eager in his hunt that he often wades in to the full depth of his long legs, and sometimes when I have been watching him crossing a pool, I have thought that for several paces at any rate he must have been swimming. At other times I have seen him actually go out of his depth, but the moment his feet have told him so, up have gone his wings and he has flown off. I have watched a dunlin swimming across a pool that was too deep for it to wade, and proceeding so buoyantly and calmly as to give the impression that this was its natural mode of progress. Young lapwings have been known to swim a broad stream while still in nestling down, and the phalarope and the avocet are waders that swim habitually. So I have no hesitation in accepting the report of one lucky observer who saw a party of migrating curlew alight on the ocean among a flock of gulls and rest there for a while.

I was out one day for the purpose of studying curlew when my attention was attracted by a party of snipe. They were busily feeding not in the water but on the mud, round the margins of some pools not far off, and I watched with great interest how they thrust their long, straight bills down to the hilt in the sand, and drew up squirming worms which they ate with evident satisfaction. They were restlessly active and in their manner closely resembled starlings. They never made a mistake. When they had evidence of the existence of a lug worm deep in the mud, they stood right over the burrow, drew in the head until the long bill was perpendicular and then drove straight down on the hidden prey. I was astonished at the number of these great worms which a single snipe could devour at a meal. He must swallow more than his own weight in less than quarter of an hour.

As I watched them I began to wonder what could be the purpose of the still longer and much curved bill of the curlew. I came to the conclusion that it simply served instead of a long neck, and that the curve saved the bird from bending his neck awkwardly every time he wished to pick up something. Hardly had I decided this when a curlew, which had settled close to my hiding place, surprised me by driving his bill down into the soft wet sand. Down and down and down it went till its full length was sheathed, and there it remained for a moment or two, as if the bird were feeling for something, before it was withdrawn. Here was a puzzle. It is easy to understand how a snipe with his straight beak can bore right down on a worm and draw it forth from its burrow, but if a curlew were to try to do the same thing he would never catch the worm, for his curved bill would turn aside before reaching it, and would find itself groping about in wormless sand. Yet the curlew

commonly uses his bill for probing mud and sand as I have described. Perhaps, instead of striking straight down like the snipe, he begins a little beyond where the worm lies and so curves back on it. If so, as his bill must go farther down than the snipe's, does he catch the worm by the tail, or does he feed on creatures that live at a lower level than the snipe can reach?

The oyster catcher, with his pied plumage and his bright red beak and legs, is another very attractive wader. He has an engaging way of calmly walking about among other waders and gulls, and inspecting things in general. As his name suggests, he is fond of shell-fish, and though he doesn't catch oysters, he eats large numbers of mussels, the shells of which he opens with his strong beak. He also uses his beak as a chisel with which to knock limpets from the rocks to which they are clinging. If he were to seize the limpet and try to drag it off he would never succeed, for the moment he touched it the creature would hold tight. But it is possible to take a limpet when it is off its guard. This he seems to know, for he goes up to a rock, inspects it, and then suddenly strikes one of the shells a sharp blow on the side, which sends it flying. Besides shell-fish he devours crabs and other similar creatures, but I have often seen him capturing worms in the manner of the snipe and the curlew.

When he does this his method is different from the snipe's. When a snipe drags out a worm, he swallows it at once and then hurries off fussily to search for another. The oyster catcher unconcernedly carries his a pace or two, lays it down, turns it over as if to examine it, and then takes it up and swallows it. Whenever I have watched him doing this, he has invariably placed his prize in a little pool of water such as is left between two ribs of sand, and at first I wondered whether in doing this and turning

it over he were washing the mud from it, and afterwards I concluded that he was. Later I changed my mind and decided that he was simply proceeding according to rule. When he is not engaged in probing for worms, he walks about the beach very deliberately, and when he finds something that may be interesting, a dead crab or anything else that might possibly be eatable, he turns it over with his bill and looks at it sagely, before he decides to swallow it or leave it and pass on. So I thought that this must be just part of his instinct, one of those mechanical operations he was wound up to do and could not help doing. The snipe, which has a very sensitive bill, knows that he has a worm the moment he touches it; but as the oyster catcher's beak has been modified into a tool for opening mussels and chiselling limpets, he has probably no feeling in it. So when he very improperly varies into such a luxurious and enervating practice as probing for worms, he can catch the worm but cannot decide whether it is good to eat or not until he has put it down, turned it over, and inspected it on both sides.

Since then I have been forced to doubt this by a remarkable performance of a curlew. I had waited for hours one day at the edge of the mudflat without seeing anything of special interest, and I was on the point of giving up and returning home, when a curlew I was watching began to probe. At first he brought up nothing, but this was no surprise to me, as hitherto any curlews I had seen so engaged had either failed to find what they sought, or, having caught it, had managed to swallow it before withdrawing the bill. Presently, however, he dragged forth a worm. He held it at the tip of his bill and, with an air of great satisfaction, stepped across to a large pool some yards away and there washed his victim before swallowing it. He did not

lay it down and turn it over in the manner of the oyster catcher, but shook it about in the water as if to rinse it and then sucked it up, and though it was a large lug worm, it disappeared in a twinkling. This done, he returned to where he had found it and probed again, and he repeated the process with his next captive and with several more. I am not able to say that this is the invariable practice of curlews when they are feeding on worms, for that is not by any means their only diet; they seem to spend most of their time picking up small creatures either in the pools or from the surface of the mud. There is no doubt, however, that the bird I watched acted deliberately; he went to the pool for the sole purpose of washing his food. I have since watched a dunlin rinsing mud from his food in a similar way. This incident was witnessed by six members of the London Natural History Society. The snipe has no time or patience for such delicacy. When he drags a worm from its burrow he swallows it without more ado, and as the victim disappears, the wet mud is roughly scraped from its body by the corners of his mouth. A tern, however, will wash sand eels in a shore pool before giving them to her chicks.

These observations have brought me face to face with another problem. The tip of the snipe's beak is sensitive and the bird has the power of raising the last inch or so of the upper mandible while keeping the remainder tightly closed. This is well known and is demonstrated by illustration in certain books, and we are told that it enables the snipe to grip his victims in the depths of the mud without exercising the muscular effort that would be necessary to open his whole long bill against the surrounding walls of mud. We are also assured by scientists that such a modification could never have been evolved except under stress of

dire necessity, that the snipe "survives" only because he is capable of doing this. But if this be true, why was it necessary for the snipe to evolve this remarkable peculiarity while his cousins the curlew and the oyster catcher, by probing in the depths of the mud, can capture worms quite easily without it? Further, why was it necessary for him to evolve a fine bill with a sensitive tip, when a hard chisel beak like the oyster catcher's would have served his purpose well enough?

One of the pleasantest surprises I ever had was given me by a bird I saw for the first time on a bitter Christmas day. It was freezing hard and heavy snow was being blown across the waste by a keen strong wind, but I went forth to see what I could see. Before I reached the mud I had to cross a patch of stones, and there I saw two waders which I took to be some kind of plover. I got out my glasses at once, but what with the snow and the wind and my cold hands, I could hardly keep them steady, and, though I felt sure that something interesting was happening, all I could make out was that the birds were strange to me. I passed on, therefore, thinking that probably I should see more of them farther out, but though I spent all the morning stalking birds on the mudflats, I saw none like them. On my return I found the two still among the stones, and with a good deal of patience and discomfort, for my hands were almost numb with cold, I managed at last to see what they were doing. They were trotting about from stone to stone. Each as he came to one paused before it, then poked his bill under it, tossed it right over away from him and snapped up the creatures that had been hiding under it. At once I realised that I was watching a turnstone, a bird I had read about but somehow had never expected to see. What surprised me most was the size of the stones they

turned. I had thought of them as running about on the shingle and feeding on the creatures they found hiding under the loose stones. But here they were tackling stones firmly settled in the mud and about the size of half a brick. They showed no hesitation, moreover, when they came to still larger stones. Down went the bill and the weight was heaved up, and if then it was too heavy to be thrown, it was pushed over with the breast. I have not yet had the good fortune to see two or more turnstones combining to turn a stone too large for one, but there are authentic records proving that they do this, and the hope of seeing such a remarkable example of bird intelligence would take me to the coast in autumn, winter and spring and in all weathers even if I had exhausted the rest of Nature.

Besides those waders I have already mentioned, several others may be seen feeding also on the mud in the pools or at the edge of the river, each with its own peculiarities. At the same time in the adjacent fields or marshes there will be flocks of lapwings or of golden plover, and away out on the sandy seashore, running in and out of the wash of the waves and picking up a living there, another member of the family, the sanderling. Among the lapwings in the fields there will be flocks of black-headed gulls. Most of the waders can swim well if they are forced to, but they never make a practice of it; the gulls are waders that have taken to a seafaring life, and feed on anything eatable they may find on the shore or floating in the river or sea. The black-headed gull is a seafaring wader that shows a strong tendency to come ashore, for he is very commonly to be found associating in marshy fields with lapwings or following the plough far inland in company with rooks. The terns, which are close relatives of the gulls, but are only summer visitors, keep to the coast and feed entirely on fish

which they capture by plunging into the sea from a height of twenty or thirty feet. If the coast is rocky, other relatives still further removed, guillemot and razorbill, will roost on the inaccessible cliffs. These birds, which in appearance suggest the penguin, also live on fish, which they hunt well out at sea by diving and swimming under water.

At sea also there is the skua, a relative of the gulls, which has become a pirate. It is not his practice to destroy his victims as do the birds of prey; he lives on their earnings. He cruises about where other sea-birds are feeding, and when he sees one of them make a capture, he sets off in pursuit of it and by persistent bullying, which is apparently no more than bluff, forces it to drop the fish. Then he plunges after the falling food and seizes it before it can reach the water. But if by chance he miss it and it fall into the sea, he makes no attempt to retrieve it.

The victim dodges several times in the hope of shaking off the marauder, but gives in all to easily. I firmly believe that if it were to show a little fight, the skua would abandon his nefarious trade. But birds as a whole seem to be peculiarly subject to victimisation by bullies. They will fight members of their own species at pairing time, but they will abandon their own hard-won property to any impudent swashbuckler, without an attempt to defend it. I have seen gulls and even other terns robbing incoming fish-laden birds at a ternery, by employing the tactics of the skua, and once when the Serpentine was frozen I watched a number of skirmishes between common gulls and coots for the possession of lumps of bread. Usually the coot retired hurriedly at the gulls' first threat, which was simply noise and face-pulling; for whenever a coot did have the courage to assert himself, the gull at once lost interest in the food. The nuthatch will allow himself to

be bullied by a pair of blue tits over the possession of a nesting site, though if he only knew it, a single blow of his powerful bill would win him the coveted prize. A whole flock of rooks will look on and clamour from a safe distance while a pair of crows harry their rookery, and even the proud birds of prey submit to miserable indignities at the hands of chattering pigmies when they are not spurred on by hunger to strike—they are hunters not fighters.

But however much we may dislike the methods of the skua on moral grounds, we cannot help being interested spectators of them as one of Nature's ideas, when they are carried out before our eyes.

Similar striking contrasts are to be found in other families. I have already mentioned the heron which is a stork-like bird. While I have been watching him standing in the shallow near the edge of a river, I have often seen his distant relatives, the cormorant and the shag, busy in the main channel. These birds are not content to wait till fish come within their reach as the heron is, nor with the comparatively small prey that satisfies him. So they go hunting for their living and seek it in deeper water where there is room for larger fish. They are therefore expert swimmers and divers, and pursue and capture their prey under water. Their structure has been modified to suit this mode of life. Instead of the long, stilt-like legs of the heron, they have short, stout, webbed paddles set well back on the body, the web joining all four toes.

These birds dispose of a small fish as they catch it, but they are so voracious that they often seize fish of a size which they cannot deal with so easily. Such a captive they bring to the surface and there, after several attempts, they usually manage to gulp it down. But once I saw a shag fail to do this. He then carried his victim to the bank where

he struggled with it violently for some time, and eventually by dint of much gulping, stretching of the neck and flapping of the wings, he succeeded in engulfing it. The whole performance was vividly suggestive of the bird's reptilian ancestry. I fully expected him to die of asphyxiation, but when he had finished he showed no sign of discomfort or of exhaustion from the strain of his effort. He just flew off to a quiet part of the mudflat, where he preened himself carefully and then sat up and spread his wings as if he were holding them out to dry. This is a common practice of the cormorant. Inevitably it suggests the clothes line, but possibly it is a survival of some ancestral habit.

Another relative of these birds is the gannet, or solan goose, but he is to be found only out at sea. He also feeds on fish and he captures his prey in still another way. He is a large white bird with black tips to his wings, and he sails along high above the sea, for the most part steadily like an aeroplane, and all the time keenly scanning the water beneath for signs of herring or sprats. As you watch him he will suddenly close his wings, and, rushing down through the air like a bolt, plunge headlong into the sea. Almost before the great splash of the dive has subsided, he reappears, having already swallowed his captive, and at once he rises heavily on his wings and flies slowly up to begin patrolling again at his favourite height. It is a magnificent and thrilling spectacle. One would think that such a specialised method of hunting must be purely a matter of instinct. But the gannet is no more a slave of instinct than the starling or any other bird. Once I saw a number of gannets diving from only a few feet above the surface. Half a gale was blowing at the time and the sea was running high, and the gannets sailed along low down and slid into the crests of the waves instead of plunging from a height.

CHAPTER TEN

BIRDS AT PLAY

The starling is one of the most interesting of all our birds, and he is at his very best in November. On a fine day in that month you may hear him singing for hours on end. He has no true song of his own—just a few squeaking, spluttering notes and a long whistle that seems to pop out by mistake now and again. But as you listen you will suddenly hear the song of a blackbird, or the call of a curlew or lapwing, or a few notes of a thrush's song, and when you look round in surprise you will see no blackbird, no thrush, no curlew or lapwing, but only your old friend the starling sitting on his favourite perch, squeaking, spluttering and whistling as happily as before. He is a clever mimic, and he must have a good memory, for in winter he imitates many sounds that he has not heard for months.

Still more remarkable is his homecoming at night. If you watch near his roosting place about sunset, you will see small bands of starlings appearing in the distance and flying swift and straight towards it. They are coming home for the night, but it is not their custom to go to bed at once. They have been very busy all day and no doubt they are tired, but they have a great and wonderful game to play and a tremendous lot to talk about before they settle down; so they alight first at some distance from the roost. More and more bands arrive, and as their numbers increase they become more and more excited. Now and then a flock of them rises and wheels about the sky for a time, then settles on the roosting trees gossiping noisily, and gradually the rest gather there until at last there are thousands of them. But they are not nearly finished yet. Suddenly with a rush and a roar of wings and a storm of excited chattering, the whole army of them bounds into the air and dashes about above the trees, turning and wheeling like a well-trained regiment of cavalry.

About sunset one evening I made my way to the Serpentine in Hyde Park, London, and stood near the bird island to enjoy the bedtime revels of the starlings. Flock after flock came from all quarters and settled on the bushes there, and there was a mighty chorus of chattering as they told the gossip of the day. Then suddenly the whole multitude exploded, mounted high into the air and manœuvred above the lake for about ten minutes, charging, turning and wheeling, now this way now that, plunging, climbing, swooping and carrying out every movement with the usual precision and discipline. They returned to their roosts and chattered more excitedly than ever, but in a few minutes up they went again. This time they startled several wood pigeons, and one of these, caught in the upward rush, found

himself swinging along in the midst of the throng. Next moment he was alone, and he turned to see the flock fifty yards away to the left. He put on a spurt and overtook them, but only to find himself alone again a moment later. Again he overtook them, and this time, to make quite sure, he passed them and assumed the lead, but next moment the starlings swerved and before he could turn, they had left him far behind. Undaunted, he followed and soon took the lead again only to be left in the lurch once more, and this was repeated many times till at last the flock retired to rest.

The pigeon was obviously fired by their enthusiasm and was enjoying the fun of the game. It was amusing to see the surprise in the turn of his head when he realised that he had been deserted, the determination in his flight as he set out to overtake the flock again, and the satisfaction with which he slackened his pace as soon as he got to the front. But either because he could not understand the signals or because his own agility was lumbering compared with that of the starling, he was more out of the game than in it. Still he had the advantage of speed in a straight run, so he could afford to be good-humoured.

Pigeons themselves have a similar game. I have seen it played by small parties of rock doves and their domestic cousins, and though it is never so impressive as the great evolutions of the starling multitudes, it is one of the prettiest sights in the whole of Nature, especially on a bright morning when their wings flash in the sun at every quick turn as they mount higher and higher until, but for the flash, they are almost out of sight.

The evening gatherings and games of the starlings have always filled me with wonder, and stirred in my heart the same kind of longing as the sight of a ship putting out to sea. I watched them spellbound when I was a boy, and now

I often go out about sunset for the sole purpose of seeing them. One starling in flight makes little appeal to us beyond the curiosity aroused by the purpose in its swift, direct movement. A single seagull in flight always charms us by the graceful and perfect ease of its action. Twenty starlings manœuvring are little more inspiring than a squad of soldiers, but when we see a vast flock of thousands of birds advancing, wheeling, swooping and turning with the freedom and dash, the order and unity and instantaneous response of an individual, the joy that animates it thrills and captivates us like the tread and the evolutions of a great army.

It is wonderful how they manage to keep in such perfect order, for their changes are often so sudden and so quick that it seems as if every bird in the flock must know exactly how and when each is to be made. They may do it by each bird watching and following instantly every movement of the one in front of it, but if that were all a pigeon would have no difficulty in acting with them, so I am inclined to believe that the call plays an important part in their evolutions. But however it is done, it is not a matter of instinct. All through the summer the young starlings practise it, first in small parties and later in larger and larger flocks. Their early attempts are crude and irregular, but gradually they gain skill, though it is not till well on in the autumn that they achieve their wonderful perfection of discipline.

The dunlin and other small waders which live in flocks, on our coasts and estuaries all autumn and winter play this game also, but while doing so they keep close to the ground. For apparently no reason but just high spirits they fly up from the mudflat where they have been feeding or resting, with a confused babble of their plaintive calls, and after dashing to and fro along the shore, turning sharply this

way and that, their white under parts flashing as they do so, may alight at the spot from which they started.

I have often wondered whether there may not be some relationship between the starling and the dunlin. The pigeon is a plover which has taken to an arboreal life; may not the starling be a dunlin which has been similarly enterprising? The fact that they both play the same game cannot be taken as strong evidence in favour of the idea, for sand martins play it also at roosting time. But the starling's speckled winter plumage suggests such a relationship, and so do his upright carriage when he is on the ground, and his manner of running and feeding. When I have been watching a company of sanderling working at the edge of the sea, running rapidly hither and thither as the waves have thrown up the small creatures on which they live, I have been amused by a certain comic solemnity in their gait which has irresistibly suggested to my mind a flock of starlings feeding on a lawn. That, of course, is pure speculation which may perhaps be easily upset by biologists, but I offer it for what it is worth as a matter of interest to observers. It is significant, however, that in our standard books the starling is at present placed *doubtfully* next to the crow family.

The lapwings, too, are well worth watching when they are at play. Sometimes in the evening you may see them playing a kind of jingo-ring. They dance up and down like a cloud of huge gnats, but all the while they are circling slowly round and round and going higher and higher until they are almost out of sight. Now and then some of them may become tired and may suddenly leave the flock and, with a few swift sweeps and sudden twists, drop so quickly to the ground that they seem almost to be tumbling. Some of the seagulls play this game also, but, instead of dancing like the lapwings they wheel gracefully and scream at the

pitch of their voices as they do so. With them it is a gathering dance, and is quite a common sight on winter evenings. I have frequently seen it from the Thames Embankment about sunset, when the birds have been preparing to go west to their roosting places. Whether it is also an election meeting I cannot, of course, say. The wild screaming suggests that either they are enjoying the fun or that they are discussing something, but in any case it brings a large number together, and when it ceases, the majority go off in a united band and presently settle down into a steady flight. On a winter evening at Battersea Bridge I saw the beginning of such a dance. A straggling company of black-headed gulls was flying leisurely westward, when suddenly one bird wheeled to the left and began to mount in a wide spiral, calling as he went. After some hesitation two or three followed him, then more and more, till about a hundred were circling and screaming high above Battersea Park. I witnessed a similar gathering one forenoon above the Strand when the city was suddenly darkened by a fog, and I concluded that the birds had come together there to decide on a course of action in face of this unexpected and threatening visitation. I have seen it also being played at high noontide on a brilliant summer day. Then my attention was first attracted by the continuous screaming, and following the direction from which the sound seemed to come, I discovered the flock circling at a great height, almost out of sight in the blue sky.

In autumn rooks and jackdaws may be seen wheeling in a similar manner above their roosting places, rising higher and higher at every turn and calling noisily the while. In their case I have sometimes thought that the game or dance was an attempt by some of the bolder spirits to organise a migration or an expedition of some kind, for it is clear

that there is usually much difference of opinion among them. Some seem to wish to start at once, for they set off in a direct flight, but they soon return to the flock, most of whom are still undecidedly wheeling "about it and about," though many may already have dropped or be dropping to the trees again. This dropping through the air, which is very rapid and is done with half-closed wings, may be witnessed any evening when the rooks return home from their day's work. My impression is that it is done for the sheer joy of the sensation, like their jubilant tumbling on windy days.

The raven has a remarkable air game of his own. When he is flying along leisurely, he will suddenly half close his wings and roll right over. The action is so rapid that the bird does not appear to drop while he is performing it, and at once he opens his wings again and continues his flight. This trick also forms part of the bird's nuptial display. So does the tumbling of the rook.

I have described elsewhere the graceful air dive which the wood pigeon performs during courtship. This is not confined to the mating season. I have frequently seen it done at other seasons by a solitary pigeon which has obviously been frolicking.

Seagulls delight in pitting their powers against the wind, and they seem to revel in the ease with which they can overcome it. One day at Falmouth during a gale I watched a herring gull floating high in the air for hours with steady wings. It remained the whole time head on to the wind, but was constantly moving from side to side on a front of about quarter of a mile, and in the process tacked gradually forward till it was halfway across the bay and then, by some slight change which was invisible to me, allowed itself to be carried back to the line of the shore.

There by another invisible change, it renewed its effortless tacking, and repeated the manœuvre again and again without a break from ten to twelve in the forenoon and probably for long before and after that period.

When they are not otherwise engaged, hawks are fond of soaring. Up and up they go in wide, graceful spirals without any perceptible movement of the wings. This beautiful action forms part of the courtship display of the kestrel, but at other times the bird does it simply for the pleasure he derives from it. The buzzard also soars, and so does the golden eagle, and he goes so high that his great bulk vanishes in the vault of heaven.

Playfulness is not one of the qualities which we should attribute to the average duck, yet the common wild duck can and does frequently become violently sportive. This happens at toilet time, when the well-fed birds bathe, preen, sleep, or feel bored. Their game, I believe, is a revolt against boredom. A party of them may be engaged in the usual toilet operations, when suddenly one of them will dive. He comes up in a few seconds, but dives again immediately, and this he may repeat several times. He reappears with a great flurry and is obviously much excited. Sometimes in his exhilaration he flaps along the surface for several yards before diving again, or he may rise and fly a few yards, then plunge headlong from the air. When one dives others usually follow suit, and often instantaneously. Gradually the excitement spreads until every few moments one or more will be diving here and there in the flock. Once while I was watching a flock thus engaged on the Serpentine, I noticed that three of the birds brought up something in the bill and ate it; but these were exceptions, and I have no doubt that the food was seized impulsively and not because it was sought or wanted.

These, however, are individual performances and, though they are play, they may be described as exhibitions of skill like tossing the caber, trick diving and looping the loop. The aerial evolutions of the starling and the dunlin are similar displays executed in unison by a multitude. Birds, nevertheless, are capable of playing competitive games. A familiar example is the noisy evening pastime of the common swift.

The swifts have always been among my favourites. They nested every year under the eaves of the house which was my home during the greater part of my boyhood. All day long during June and July these swifts were on the wing, wheeling and darting about high in the air almost overhead, either hunting prey or playfully chasing each other. They seemed to find a plentiful supply of food within a radius of less than a hundred yards of our garden, so they were constantly in sight. Their graceful flight, their joyous screaming and all their various activities were and always have been a continual delight to me, their speed, their skill, their marvellous powers of endurance, a continual wonder. There is a peculiar flicker of their wings that distinguishes them at a glance from all our other birds and, even at a distance, from the swallow which they so much resemble in form. Their wing beats are so quick that it is difficult for the eye to catch them separately, but after many attempts to study the action, I have satisfied myself that this fascinating flicker is due not so much to the rapidity of the stroke as to the unique power the swift has of paddling with its wings. It is able to move them together, as is the universal custom among other birds, or alternately, and it seems to adopt the latter method chiefly when it is forced to make a sudden spurt to overtake some nimble insect. At such times, if the quarry dodges as it

seems to do very often, an extra powerful stroke of one wing thrusts the swift round at right angles to its course if necessary, and this is followed by a quick jerk forward as the bird reaches out and snaps its prey.

As a rule the swift hawks at a great height, well above the range of the swallow and the martin, often several hundred feet from the ground, where it has no competitors; but in certain states of the weather, especially when the air is heavy and moist, it flies low, and then, of course, its movements are more easily studied. Its extraordinary skill is well displayed too when it has young in the nest to feed. Then it is busy all day long hunting high in the air, with no time to spare for play but with occasional breaks in the work to allow of visits to the family. It is the approach to the nest that is so wonderful. Other birds usually do this by alighting near the site and from there reaching the nest by means of a short, easy, hovering flight. But the swifts cannot do this as their feet are not suited for perching. Instead, they come down from their hunting range at full speed, and as they near the home, dive in a long swoop to within a few inches of the ground, then rise with the impetus of the fall and, as you wink, expecting them to be dashed to death under the eaves, shoot straight into the nesting hole. Sometimes they cling for a moment or two to the wall underneath it, but this is when the mate is already in the nest.

But though I admire the swifts at all times, I love them best when they throw themselves into their wild and boisterous evening game of "Pass me if you can." The game consists in trying to overtake and pass the leader and keep the first place as long as possible. It is played on a recognised course with definite turning points. In the upper air where fixed marks do not exist the course may vary, but even

there it is remarkable how the birds keep to the same general route. Up there the fun usually begins, and round and round they flash pell-mell, screaming with the joy of the hunt; but when the pursuit waxes too hot, down they come with a rush and swing past some particular tree, chimney or building, or sweep on an inside curve, a feat demanding a much higher degree of skill, by banking against a gable, screaming as they turn, either from the thrill of the movement itself or from the sudden realisation that it has enabled the leader to gain a little, then up and away they speed again on another long chase in the open.

Two of the chief marks chosen by the swifts I knew in those early days were the chimney of a low wing and the gable of the main building, and they rounded the one and then immediately wheeled past the other with their wings almost touching the wall, screaming wildly and seeming to derive the keenest pleasure from cutting the curves as fine as possible. They obviously perceived and enjoyed the risk and, like good athletes, took it confidently with the double object of displaying their skill and of gaining advantage by it. This manœuvre was repeated many times in the course of an evening, and was renewed every season.

The swifts play this game most furiously in the latter part of July when the cares of nesting are over and the young ones are able to join in the fun. No doubt it helps to bring the muscles and the powers of flight of the youngsters to the fullest development possible in the short time they have to prepare for their southward journey, and this some naturalists would say is the useful purpose it serves and is the reason why it survives. But as it is played by the males every evening after the day's work is done, we must find some other explanation for it. Many people play

golf because it does them good, but they are not golfers. The true golfer plays because he loves the game, and I am quite satisfied that the swifts love theirs. It is a game of skill and endurance and it is what they live for. Some people devote their leisure to sport, others to music. Many birds sing when they are not otherwise engaged, and the swifts which are busy from dawn to dusk hunting for a living, are able, for a few minutes before they retire for the night, to realise that they are alive, and then with every atom of their being they throw themselves into their mad, glorious contest. This game, like the songs of other birds, is not instinctive. It is passed on by tradition from one generation to another.

But all bird games are not either instinctive or traditional. I once saw a new game invented on the spur of the moment by a flock of black-headed gulls.

I used to visit St. James's Park in those wonderful days before the Great War, and one afternoon I had the good fortune to see some gulls there playing a remarkable game. They might have called it "Perching" or "Tree-tops," for it consisted in trying which could stand longest on the topmost twig of a tree. There were about twenty of them and they were circling gracefully round and round in the air, as they are so fond of doing. But now and then one, sometimes two or three, would descend and try to alight on a slender twig. Often they failed altogether, for, of course, they have no means of gripping a branch, but sometimes they were successful, and then they stood on the swaying perch for a few seconds, doing their best to keep steady, yet never daring to fold their wings, which they held stretched upward in graceful arches, ready to support them if they should happen to overbalance. They were quite silent, but they seemed to be enjoying the fun of the

thing. It was always the same twig they tried one after another, and the same birds returned several times to make fresh attempts. Obviously they were amused by the novelty and did not care to admit failure.

It is said that among the lower animals only the dog can laugh, and that he has acquired the power through his long association with man. A dog laughs, however, when he is playing his own natural immemorial game of "Catch me if you can," just as we ourselves do when we are engaged in similar games, but his laugh is silent. Those gulls were silent and they were not laughing with their faces, but there was laughter in their actions and attitudes. It was not that they were comic and therefore I was laughing at them. I mean that they were laughing inwardly and that their feelings were unconsciously expressed in their bearing as a man's may be even by his back.

I have said that it was a new game and invented on the spur of the moment. So it was, but none the less it is as old as the fields and is invented afresh by every family of children who have the good fortune to live near, or to discover in their travels a fence with a narrow top rail or a horizontal bough on which they can climb and which without being dangerous, affords them a precarious foothold.

It is now not uncommon to see black-headed gulls perched on trees in Hyde Park, but it is still sufficiently remarkable to be recorded in their diaries by observant nature-lovers. Those I have noticed myself have usually been careful to select steady, substantial branches. But in November, 1928, I witnessed another attempt by several to alight on swaying twigs. This was near the Round Pond in Kensington Gardens. It began with a party of birds playing the exciting game of "King of the Castle." The stem of a large tree had been broken at the top, and about

six feet of it stood up stark and withered above the surrounding boughs, presenting a foothold for gulls such as is familiar to them at the seaside, where masts are plentiful. One of the birds perched on this and the rest attacked him one after another, swooping down at him with a display of ferocity, but never actually striking him. The attack was usually made from behind, the king looking round at his opponents and shrieking defiance. Presently, as the result of a more deadly threat, he overbalanced and gave up the seat, and it was immediately occupied by his conqueror, who was at once attacked by the others and shrieked his defiance as his predecessor had done. With frequent changes the game was kept going for about fifteen minutes. Sometimes both victor and vanquished would go off sparring and shrieking at each other, as boys often do in similar circumstances, and the coveted stump was seized by a third bird. As the fun waxed stronger the number of the players increased, till nearly thirty birds were engaged. There were plenty of bare boughs on neighbouring trees offering suitable resting-places for gulls if such had been what they wanted, but none of the birds made any attempt to use them; they were not seeking rest but amusement. At length they tired of the game and most of them settled on the pond, leaving one in undisputed possession of the stump. But a few, still excited, visited other trees and avoiding the obvious perches, attempted to alight on thin, swaying twigs. Two of them succeeded, but remained in position for only a few seconds, and that feat they accomplished by keeping the wings expanded and flapping them gently at each downward swing. As they turned their heads and looked at each other, it was impossible to escape the impression that they felt that what they were doing was absurd but none the less amusing.

So far as I know, it is only by a coincidence that the black-headed gull is called the laughing gull, or as they express it in scientific lingo, *larus ridibundus*. That name I understand has been given him because of his call note, but I have never been able to detect any semblance of a laugh in this sound. I have often heard the lesser black-backed gull laughing. "Ha-ha-ha," he says quite distinctly, but it it a cold, ominous, almost blood-curdling kind of laugh. The herring gull has a similar note, but it is lighter, higher in pitch, and not nearly so tragic. The common gull's call might be described as a giddy laugh. It is a pretty and pleasing note. Possibly early observers by some confusion attributed it to the black-headed gull. If the call of the black-headed gull suggests anything human, it is something ultra-human. It is the frenzied falsetto of the villainous baronet, whose wicked schemes have been finally thwarted by the handsome hero. *Cur-r-r-se ye!* he shrieks, and again *Ker-r-r-r-r-r-r-rse ye! Ker-r-r-r-r-r-r-r-r-rse ye!* and he leans forward and stretches forth his quivering head in the true manner of melodrama, to emphasise the awfulness of the malediction. All the more credit to him, then, if in his calmer moments he is sometimes able to forget the past and laugh.

CHAPTER ELEVEN

SPRING AND AUTUMN FASHIONS

LIKE human beings, birds wear baby, juvenile, adolescent and adult clothing. The baby dress is down and this bears little or no resemblance to the plumage of the parents. The nestling down of the robin, for example, is black, and young owls are quaint little figures covered from head to foot in white.

This dress is quickly replaced by feathers, those of the wing appearing first, and when the young bird leaves the nest, it has a complete new suit, which may be distinct in colour from both its baby clothes and from those of its parents. When the plumage of the adult male differs from that of the adult female, the young of both sexes, in the early days of their freedom, are usually similar to the mother, but when the parents are more or less alike, the juveniles have a special plumage of their own. For instance, young chaffinches before their first autumn moult resemble the adult hen, but robins of the same age have a speckled brown

coat which shows no trace of the red breast. The young of coot and lesser spotted woodpecker are actually favoured with brilliant colours which they lose as they grow older.

This juvenile plumage is believed to be ancestral. That means that it was the mature plumage before the present-day colours were acquired, or more correctly, the plumage of the bird from which the family as we know it to-day is descended, and it enables us to trace relationship among various species which differ remarkably in their adult dress. For instance, the young of the song-thrush, the blackbird, the nightingale, the redstart, the stonechat, and the wheatear are brown with lighter markings especially on the back like the robin, and these birds all belong to one family. Again, the young gulls are brown with darker markings, and this colouring indicates relationship with the great family of Waders.

The young speckled robins are tended by their parents for ten days or so after they leave the nest, but at last they are driven off to take care of themselves. They hang about the gardens and lanes all summer, and together with young birds of other species, they form a serious puzzle to beginners. When August comes they change once more, and this time they assume a plumage which to all intents and purposes is that of the adult. Nevertheless, when examined at close quarters and compared with that of an older bird, it is found to differ slightly both in the area covered by the red and in the shade of the red itself, which is not so bright as it will become in another year.

This is the simplest form of moult, but it is by no means the only one. In some species the young, a month or two after leaving the nest, change every feather including those of the wings and the tail, and are therefore full grown in their first winter, in others they do not reach this stage

until their second, third, or even fourth winter, and in the course of their progress may wear several distinct plumages. Adult birds may have only one annual moult like the robin, or they may have one in autumn and another in spring, which may be complete or may affect only a portion of the coat such as the head or the breast, and results in a special spring or breeding plumage. Or they may avoid this second moult and attain the same end by the simple process of dropping the tips of the feathers on certain parts.

What happens in moulting is that the new feathers begin to grow and the old ones then drop out, but the changes are so gradual that it is only possible to study them thoroughly by means of a callous collection of skins. Some phases of the change, however, are obvious and full of interest to the ordinary observer. The wing and tail feathers drop one at a time on each side. That is to say, when a particular feather on one side drops, the same feather on the other side falls also, though, of course, not necessarily at the same moment. When these have been replaced, or when the new plumes have reached a certain stage in their growth, the next feather on each side drops and so on. The first of the principal wing feathers to go is the ninth counting from the tip, the next is the eighth, and the others in this order, the last being the outermost. When the wings are at full stretch, therefore, the gaps appear to begin with about the middle. In the tail, moulting starts with the central feathers, which are followed by the next on each side till the whole set has been renewed.

This moulting of the wings and tail is most noticeable on the rook. Every one has seen rooks passing overhead with feathers missing from their wings, and any one in a position to make daily observations of a rookery or of a particular flock of rooks, may watch the gradual progress

of the change. The moulting of the rooks begins at a remarkably early date. This is obvious to every one, for it is soon after May comes in that the birds appear with ragged wings. When we consider that this is the busiest period in the rook's life– for its family is growing fast and clamouring all day for food, which it must be constantly finding and fetching—it is astonishing to think that Nature should thus handicap the bird in its work. But the very fact that it has chicks to feed compels the rook to seek supplies as near as possible to the nest, and consequently the journeys though frequent are short, whereas later, when the young have flown and are able to take care of themselves, the feeding ground is usually some miles from the roosting place, and, moreover, the flock often takes to a nomad life, making long semi-migratory voyages in search of special food.

Again, the most outstanding feature of the rook is the patch of white skin at the base of the beak. By this we distinguish it in the field from the carrion crow, but before and after their first autumn moult the young show no sign of this mark. Even the adults, when after four months they have completed their new dress, have the chin fully clothed with black down, so when seen from below it is not easy to determine whether they are rooks or crows without hearing their calls. This down wears away quickly, however, and by January there is no trace of it. The young keep this part fully clothed with feathers throughout the winter, but moult those feathers during the spring. They are now, to a casual observer, exactly like their parents, but their coats are not nearly so glossy as those of the older birds, and they do not nest this season, for they are not full grown till after their second autumn moult. So in this species there is a partial spring moult in the first year, and

in subsequent years a small but distinct change is brought about by wear and tear.

Starlings grow up more quickly. When the young leave the nest, they are dull brown and have brown bills. After a few weeks they begin to shed this dress, and by the beginning of September they are clothed in a complete new adult suit. They can still be distinguished from their elders, however, by the fact that, while both have white or buff tips to their feathers, those of the youngsters are much the larger and give the birds a boldly spotted appearance. In the course of the winter and early spring these tips gradually wear away and practically disappear from the older birds, leaving the metallic greens and purples of the plumage unbroken and resplendent, but on the younger ones they are only reduced and still speckle the coat, even in the nesting season. The bill of a starling, old or young, is brown after the autumn moult, and in spring it is bright yellow. During the winter there is just a little yellow at the base underneath, and I have noticed that this colour begins to spread early in January.

The winter wear and tear has a still more surprising effect on the plumage of some of our other common birds. The whole of a cock sparrow's coat is brightened by this process, but the change is most noticeable on his throat and head. After the autumn moult his bib is black, much speckled or streaked with white and looks ragged and unattractive, but in the course of a few months the white disappears and with it the untidiness, the whole patch becoming jet black, and he appears as smart and dapper as a West End beau. At the same time, the brown on the sides and the back of the head extends and becomes a browner brown, and the grey on the top of the head a greyer grey. The blue on the chaffinch's head and the chestnut on its

back, which have been dull and uninteresting for months, shine out brilliantly in early spring, as if they had been replaced by new plumes fresh from the dyer, and as the nesting season advances the linnet gradually, and it would almost seem too modestly, displays a crimson breast, besides other glories which can be enjoyed only by very close observers. These colours are acquired with the autumn moult, but they are hidden at first by buff or white tips or by a mixture of grey branches which are worn away by the action of wind and weather, so that the more they are worn the brighter the feathers become.

What a wonderful provision this is, and how well "thought out"! It protects the birds in winter by giving them a dull inconspicuous coat, preserves the freshness and brilliance of the colours through the troubles and trials of the long dreary months, until they are required for the important business of mating, and it does away with the need for a second moult which must always be an unpleasant experience. Robin and rook, which moult only once a year and have no such convenient outer cloak, are much brighter in plumage before Christmas than after it. But what of the linnet? Beautiful colours are worn for the single purpose of securing a mate, say the scientists, and birds that possess them owe their present existence to the fact that at some critical period in their history they were able or lucky enough to produce them, or to the good taste of the females which year after year throughout the ages have selected the more attractive males. So we may conclude that those robins and rooks that can retain the brilliance of their plumage longest will be most successful in the competition for the possession of the most attractive hens, and similarly those cock sparrows and chaffinches that arrange to complete the disappearance of their feather tips at the most

convenient season. But a cock linnet is seldom at his best until after the nesting season is past and he is about to undergo his annual change into his drab winter garb. One of the delights of July is to see a wandering party of cock linnets sitting on neighbouring whin bushes and singing sweetly together, or uttering one after another those three plaintive notes which suggest moorland and golden plover rather than the cheerful environment of an English common. I have sometimes thought that these gatherings are organised as much for a mutual display of waistcoats as for a companionable sing-song. The fact that they take place during the winter does not detract from this idea, for if you are forced to wear a particularly dull overall, it is some consolation to know that your rivals are no better off, and further, if you know that in the course of time their breasts and your own will be flushed with a wonderful and fascinating crimson hue, you may be excused if you are tormented with a burning curiosity to see how theirs are getting on. But, however that may be, here is the cock linnet which ought to use his crimson breast for mating purposes and doesn't, and seems to get on quite successfully without it. At any rate he finds a mate which does not spurn him for the want of it, for in spring when the love-making begins, there is scarcely a sign of the glory which is to come, and even after nesting has been undertaken the amount of colour that shows is often trifling, and in some cases is not red at all but dull golden brown. This puzzled me when I first met with the linnet, and before I knew what he was. I studied his song, his plumage and his habits and then went home to my books. But they all declared that the linnet had a crimson breast, and, as the birds I had seen had not, I concluded that they belonged to some other species, and it was only after repeated visits to the same spot

that I noticed the red beginning to show about the middle of the nesting season.

We are too ready to assume that everything we see in Nature is perfect, that evolution is a thing of past ages which accomplished its work and retired, leaving each species with a complete equipment for the remainder of its struggle for existence. The truth is that all life is in a continual state of flux. A common and clinching argument in a familiar controversy before evolution came to be accepted as an essential part of our everyday thought, was: "Well, if there is any truth in this evolution you talk about, why don't we see it happening now?" But here is the cock linnet, one of our common birds, actually before our very eyes developing a new kind of waistcoat, and doing it in the first place for his own satisfaction, not for the benefit of his wife, which is contrary to the printed rules of the game. No doubt in time some of his offspring will use it at the pairing season to take a mean advantage of rivals, but meanwhile the ladies of the race, like the majority of their sex, being rigidly conservative, his mate is probably scandalised at his ridiculous, foppish, loud taste, and tells him in pretty plain language that if she had only known about it sooner she would never have married him. She will admit that she can never understand why her greatest great-grandmother objected to singing, but as for red waistcoats—well, when there is a family of chicks to provide for, there is no time for such frivolity. None the less, she has a sneaking admiration for it, and when she becomes more used to it she will fall under its spell, and if it should happen to show at the proper time, she will recognise it as one of the desirable qualities of a husband. It is even possible that in the remotest future, if circumstances permit, she will have overcome her scruples so far as to follow the example of

the lady kingfisher, and adopt the silly fashion herself. In the meantime, what can be said for those eminent scientists who assert that she selects her mate by the particular shade and extent of the rosy patch on his breast, or as the late Professor J. Arthur Thomson would have had us believe, by the "*tout ensemble*," weeks before the colour begins to be visible and months before its full glory and expanse have been determined?

In two widely different species, the pied wagtail and the lapwing, the change from winter to spring and spring to winter plumage is most conspicuously shown on the throat. In winter both have a white throat and a black crescent-shaped patch on the upper part of the breast, but in spring they have throat and breast black in one continuous piece. This spring transformation is brought about not by abrasion of feathers, as in the case of sparrow and linnet, but by a distinct moult which affects the greater part of the plumage and is completed just about courting time. A cousin of the lapwing, the golden plover, is so altered in appearance by this second moult that to the casual observer he is two different birds. In winter his whole coat is mottled black, yellow and white, except the under parts which are white. In spring the under parts are jet black and from them a broad band of black passes up the middle of the breast and throat to the chin, cheeks and eyes. Bordering this there is an equally broad strip of white on each side, running from under the wings up the breast and neck and over the eyes and meeting on the forehead. The back and wings are mottled as before, but the black and yellow are in brighter shades.

The black-headed gull, which is another cousin a little further removed, but which commonly associates with the lapwing in winter, the two flocks mixing freely while they

are on the ground but separating immediately when they are disturbed, in spring puts on a chocolate hood, which covers the head, throat and chin. The change takes place in February and March as a rule and occupies about a fortnight, and as the bird is a denizen of estuaries, often makes its way far inland, invades city parks and lakes, and boldly accepts food from the hands of citizens, the process may be easily watched. Once it was thought to be brought about simply by an infusion of colour into the existing feathers, but it has been proved that not only are the brown feathers new but also some of the neighbouring white ones on the neck and breast. After the autumn moult the head and throat are white except for a small brown spot behind the eye and another just over it. One of the first signs of the returning spring hood is the joining of each pair of these spots by a dark line across the head; it is almost as if the artist first sketched the hood and then filled it in. Young birds of the year also have these eye-spots in their first winter, but they may be recognised by the oblique brown markings on the wings, the broad black band across the tip of the tail —the last traces of the ancestral plover dress which they still wear as a baby garb in the first two months of their lives—and by their blackish orange feet and bill. These birds grow up after their second autumn moult, when they throw off the brown wing markings and the tail bar, and their feet and bill become blood-red, and they assume the chocolate hood for the first time in the following spring. Some of the larger gulls pass from the juvenile to the adult state by several stages, each of which is represented by a separate plumage, and do not reach maturity until their fourth or fifth winter.

Now, as this chocolate hood of the black-headed gull, as well as similar characters in plover, wagtail and other birds,

appears in spring just before pairing time, it is known as the breeding plumage. There are exceptions, as, for example, when some gulls of a flock assume the hood in December. These may be precocious individuals which would be prepared to nest at that season if circumstances would permit. A similar precocity in a flock of golden plover would be dangerous, because the winter plumage of this species is protective whereas its breeding plumage is conspicuous. But what are we to think of the mad revolt of the common wild duck or mallard? The duck has only one annual moult, and she wears the same subdued colours throughout the year. The drake has two, but he goes through his autumn moult in May and June when he puts on a plain coat like the duck's, and his spring moult in August and September, at the end of which he appears once more in all the wondrous splendour of his breeding plumage. During the early part of the nesting season he is very attentive to his mate, but he takes no part in the incubation of the eggs, nor in the rearing of the family. The duck does that herself, covering the eggs with down from her breast to keep them warm during her brief absences. Meanwhile the drake kills the boredom of a lonely life by hustling through the unpleasant process of moulting. He is in such a hurry to be done with it that, as soon as he has replaced the worn-out brilliance of his head and body by a coat of modest hue, he casts all his wing and tail feathers at one time, though in doing so he is depriving himself for a week or two of the services of his best friends in moments of danger. Because of this we assume that the dull feathers he wears then are intended to protect him in his period of weakness, and they are therefore known as his moulting or eclipse plumage. But if they serve this purpose it is only because they have been adapted to it; they are simply his

pristine protective winter coat advanced a few months to suit his convenience. He is settled for the summer in quarters where food is plentiful, so there is no need for him to roam, and his powers of swimming and the fact that he can dive if necessary enable him to keep out of harm's way. Here, then, is an opportunity for him to get through quickly the double misery of moulting and wearing a drab attire, which he hates but must accept because it is an unwelcome inheritance from remote ancestors, which were much less self-reliant than himself. He hates it, and therefore he submits to it only for a month, then begins to replace it by the beautiful feathers of his breeding plumage which he wears boldly throughout the winter. He is proud of his beautiful colours and loves to display them, and what cares he for danger when he knows that he can easily outwit the master mind of the sportsman in spite of all his unfair contrivances?

This brilliant plumage of the drake is one of those dangers to the race which by all the rules ought to have exterminated the species ages ago. Everything that is an advantage to the race survives, we are told. But this is not the result of a series of miraculous accidents each of which has bounced a timid and wary mate into blind acceptance. It is the outcome of a teeming, ebullient vitality which can brook no rule but its own, but modified and restrained by perfect taste, and in brazenly flaunting it in the autumn, the bird is throwing discretion to the winds. But the same splendid qualities that evolved the colours and the daring, have produced also an abounding intelligence which has more than counteracted the evil effects of his madcap impetuosity.

The ptarmigan is not so reckless as the mallard. He lives high up on mountain sides, so it might be thought that in such remote parts caution would be unnecessary and

protective colouration would therefore not be developed. But he actually carries a stage further than any other British bird the idea of imitating his surroundings in the colouring of his dress. His motto is that of Savile Row, that the well-dressed man is never conspicuous.

In summer the plumage is a bold heather mixture of buff, white and black with pure white underparts. When the bird is on the ground this coat renders him almost invisible, but when he is in flight the white patch underneath is very conspicuous (the one point in which he has failed to achieve perfection), and by this he may be distinguished from the red grouse which he resembles in form. After the autumn moult he appears, or rather disappears, in a grey coat which is a marvellous imitation of the grey rock which is the principal feature of those high altitudes. He is not content, however, with only two changes in the year. Spring and autumn fashions are all very well, but what about winter? So he moults once more, and by midwinter his whole plumage is pure white.

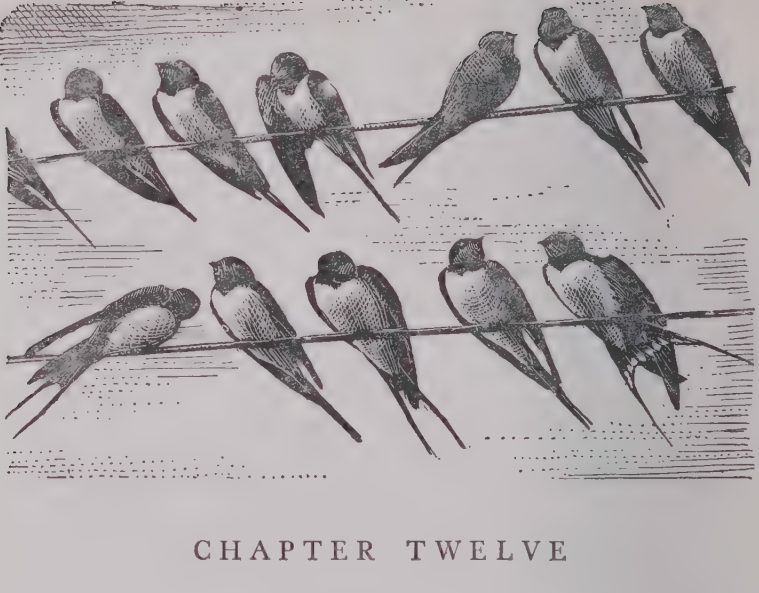
Another very remarkable advance on the ordinary customs of birds has been made by the ruff. In winter the ruff and the reeve (which is the feminine of ruff) are identical except that the male is considerably larger, but in summer the male is distinguished by an extraordinary development of the feathers on the neck and breast. These feathers are abnormally lengthened and give the impression of a voluminous cape put on the wrong way round and secured by a large knot on the back of the neck. It is from this peculiar adornment that he obtains his name. Striking and extraordinary though it is, however, the most astonishing feature of this summer plumage is the fact that whereas every adult male wears it, each individual has his own special colour scheme. The ruff, in short, has achieved the

human ideal of individuality in dress, and so conceited is he of his appearance that, like the human beau, he resorts regularly to some recognised promenade where he attitudinises for the satisfaction of his own unbridled vanity and for the envy and despair of his rivals. This deplorable vainglory deserves only reproof from the modest little hen, but, sad to relate, it has quite the opposite effect on her, for instead of leaving him alone till he shall have come to his senses and then pairing with him according to the custom in the rest of the wader family, she is so helplessly overcome by his ridiculous coxcombry that she loses all her self-esteem and allows him to marry as many wives as he likes.

This strange bird formerly nested every summer in Britain but was driven away by the greed of collectors. It still visits us in spring and autumn, and I am glad to say that through the strict preservation of certain bird sanctuaries on the east coast, it is being tempted to stay, and one pair actually nested in Norfolk in 1922.

Another human ideal in dress, this time a feminine one, has been achieved by the phalarope, an enterprising member of the wader family which has tired of paddling for a living and taken to swimming instead, acquiring partially webbed feet in the process. In this species the female is more brightly coloured than the male and is so thoroughly emancipated that, though she condescends to lay the eggs, she leaves her smaller and very much subdued husband to carry through the whole tiresome business of brooding and rearing the young, while she spends her days very pleasantly gossiping with her friends.

Two species of phalarope, the grey and the red-necked, visit this country on migration in spring and autumn, but a number of pairs of the latter breed regularly every year in Orkney and Shetland and in the Outer Hebrides.



CHAPTER TWELVE

MIGRATION

To most of us migration means the coming of the swallows and the cuckoo in spring and the going of the swallows in autumn. We know, of course, that many other birds visit us in spring, and we miss them in winter and are glad when they return, but we have no knowledge of their movements after they have nested. They disappear and we presume that they have gone. The flocking of the swallows in preparation for their departure is an event that cannot escape our attention. We notice that they increase in number as the time approaches, and that one day they are here and the next they are not. If we are fortunately placed, we may see a succession of flocks following each other at intervals of hours and days, but unless we are careful observers, we may not realise that these are not simply the

first flock still clinging to the neighbourhood, though we thought they had left a day or two ago. We may also know perhaps that migrants are divided into summer and winter visitors, but there for most of us the subject ends. And there also the whole subject of birds ends for most people until they hear the spring songs again. But to those who care to devote time to watching them, birds are interesting throughout the year, and at no season more so than during the great period of autumn migration. In spring, migration happens almost before we are aware of it. The birds accomplish the last stage of their journey by night and in the morning we see and hear them in garden, field and wood. Those species that nest farther north are in such a hurry to reach their summer homes that they give us few chances of making or renewing our acquaintance with them as they pass through the country. But on the southward journey in autumn all migrating birds are more leisurely, and observers who know where to look for them have many opportunities of watching them and noting the fluctuation of their numbers from the middle of July onwards.

The season of migration opens when the nesting season ends, and lasts until the nesting season is in full swing again next May, or rather, as I have already suggested in Chapter Two, until the beginning of June. The going and the returning of our summer visitors are only the most noticeable feature of it. As in spring, there are local movements of our resident birds in autumn which are known as partial migrations. Many of these birds actually winter abroad, and they are among the first to go, just as they are the first to return in spring. The summer visitors follow, then the passage migrants come and go, and while the great procession of these adventurers is still at its height, our winter visitors begin to arrive. When the last of the hun-

dred or more species which winter with us has reached our shores the autumn migration ends; but as I will show in the chapter on "Birds in Winter," further movements may take place during the winter months. The spring and autumn migrations are thus regular and limited movements but they are linked by irregular winter movements, and the season may therefore be said to be interrupted only for a few weeks in summer while the birds are tied to their nesting areas by the needs of their helpless young. Even this brief period is broken in June by the flocking of starling and lapwing.

As soon as the young ones are able to take care of themselves, most birds begin to wander. They have now no nest to which they must return and their wings will carry them anywhere they please. They care not in which direction they may go, but sooner or later they find themselves on one of the migration routes, meet and join company with other travellers of their own species and before long arrive at the coast.

Every one who has watched the progress of a family of young birds in his own garden, knows that a week or two after they leave the nest they are driven away by their parents. This does not mean, as some observers have hastily assumed, that they are being hustled out of their parents' territory in order to make way for a second brood for which the old birds are already preparing a new nursery. They are not being driven out of the territory; they are only being told in a forcible way that in future they must depend on their own efforts for their living. As a matter of fact, they may remain in the territory for the rest of their days provided that they do not expect their parents to support them, and give their father no cause for jealousy when they are preparing to nest in subsequent springs. It is quite

common for a garden to be populated with adolescent blackbirds or thrushes or robins while their parents are rearing a second or a third brood, for by that time the food supply has not yet reached its maximum, and a first brood of waterhens when nearly full grown will help their parents to rear a second brood, actually receiving the food from the old birds and passing it on to the chicks.

But the youngsters, being now independent, tend to move away from their native place, and there is evidence that some of those belonging to so-called resident species, leave this country in the latter half of July. Increasing numbers of them depart during August. These movements are gradual and almost imperceptible in most parts of the country. They become more obvious on or near the coast where the various kinds may be seen passing in small parties, all of which are travelling in the same direction.

Everywhere, however, we cannot help noticing the flocking of young starlings in June; we recognise them as young birds by their brown plumage and brown beaks. While their parents are engaged on rearing second broods, or continue to live in pairs near their nesting site, these youngsters feed in the fields during the day and at sunset gather at some suitable resting place and make their first attempts to play the great game of the race. As the season advances they are joined by more young birds and many adults, till late in autumn the evening congregation of starlings may reach enormous proportions. We naturally assume that these are all birds that have been reared in the neighbourhood. But the starlings we saw in spring and summer may have gone south or west or into Ireland, and those we see in autumn and winter may have come from farther north or east, or they may be foreigners, for huge flocks of these birds arrive on our eastern coast in autumn

from north and central Europe to take refuge from a sterner climate than our own.

Dwellers on the uplands notice that the lapwings close their ranks about midsummer and that in August they disappear. People who live in the lowlands, and especially near flat marshy ground, see these birds only in winter, and in winter also the people of the coast see them consorting with black-headed gulls in the fields near the shore. Londoners enjoy the company of seagulls in autumn, winter and early spring, but seldom in late spring or summer except when they make their annual holiday trips to the seaside. Indeed, these birds are to London what the swallows are to the rest of the country, only in the opposite way. Their coming in September foretells the hard dark days of winter, and to those who know and care to look for the signs, their preparations for going are one of the first real promises of spring.

After living for years in the city, I found myself one winter evening in a strange town on the coast. It was dark and the streets were badly lit, but before going to bed I went out to get a breath of fresh air, and to do some exploring. I could see very little, but presently I came to the harbour, and, as I stood for a moment or two before turning back, the cry of a bird came out of the darkness beyond. It was just three notes, *Tyu-hu-hu*, clear and shrill, ringing on the still night air like the sound of a crystal bell, and with a touch of melancholy in it. The first note might be A of the second octave and the other two something between A and A flat. It was the call of the redshank. My thoughts at once went back to the happy days I spent on the hills above my native place, for there I knew the redshank well as a summer visitor. And next day, on the marshes which I found on the other side of the harbour,

my memory was sent still farther back by another call, to my earliest recollections of direct interest in Nature. I had been sent to a remote mountain village to recover from some childish ailment, and had been given a wooden hoop with which to amuse myself. It was my first hoop and I made good use of it, running with it about a mile down the steep hill road, then climbing laboriously up only to run down again. But often as I went and came a strange and fascinating whistle reached me from away out on the moors that stretched on either hand, and always as I heard it I abandoned the hoop and climbed up the bank to discover the cause of it. I could never see anything, and it became doubly fascinating as a mystery. Somebody told me it was the call of a bird, but I didn't believe him, and it was not until years later that I actually saw the bird, and when I did I was duly impressed by its quaint appearance. It was the curlew, and I knew and loved it well as a regular summer visitor to the uplands, and now, after years in the city wilderness, I had found it and heard it again in its winter haunts, the marshes and mudflats of the sea coast.

This experience impressed me deeply, partly no doubt from an absurd, but none the less vivid impression that the birds I had heard were the actual individuals I had known years before on the moorlands some hundreds of miles away, but also because it was the first time I had myself obtained evidence of a complete cycle of migration. When we record the arrival of swallows and observe them flocking in preparation for departure, we see only one part of the cycle and most of us must trust to the reports of others and to our imagination for the rest. But even if we were able to journey to South Africa and to observe the arrival and departure of our English swallows at that end of their range, I doubt whether the experience could be so impres-

sive as that we can enjoy at home by making the acquaintance of our waders in both their summer and their winter quarters, though the difference between the two may be only a few miles. Others of our resident birds change their quarters in spring and autumn, indeed most of them do. They come farther south, and those of us who live in the south see more ducks, more starlings, more pied and grey wagtails, more skylarks and even more redbreasts in winter than we do in summer; but they spend their time there in a similar environment to that which they occupy during the nesting season. Some of our waders occupy an entirely different environment in summer and in winter. The redshank is common all the year round on our coastal marshes, but visits the moorlands in spring; the golden plover nests on the moors and the lapwing on upland pastures and dry ploughed fields and both resort to lowland marshes in winter ; and the curlew nests on the moors and winters on the mudflats, thus making a complete change of diet as well as of environment.

These are local movements of our home birds, but they are none the less migrations, that is, flittings from the nesting ground to a general feeding haunt a considerable distance away and back again at definite seasons. They continue throughout the autumn, but while they are in progress, the other great movements of birds take place.

The first of our summer visitors to go is the cuckoo. The adults leave towards the end of July and the young some weeks later. The swifts begin to go early in August and most of them have disappeared before the end of that month. The majority of our summer visitors depart during September, but it is exceptional for any one to witness these movements, for most of them take place at night. What we may observe is the passage along our coasts of flock after

flock of birds all travelling in the same direction. Coasts and rivers are highways which are used regularly by migrating birds, but not by any means exclusively. I have seen migrating flocks cutting across country where there was no natural line to guide them. In two consecutive autumns I was awakened during the night at Haywards Heath in Sussex by the passage overhead of a flock of waders. In both instances the birds were moving southwards and presumably had left the Thames valley and were making for the south coast. The largest flock of swallows I ever saw was at Newlands Corner in Surrey. The whole air was full of the birds which were moving southward across the Downs and, though they were hawking as they went and were therefore in very loose formation, were travelling rapidly.

Such records are obtained only by chance, but other and more interesting evidence of migration can always be found by any one who wishes to do so, between the middle of July and the end of October. During that period knowing observers pay frequent visits to marshes, estuaries, mudflats, lakes, reservoirs and sewage farms, for in such places they are almost sure to find not only numbers of curlew, redshank, golden plover, lapwing, ringed plover, snipe and dunlin, but also many interesting strangers which have come from the far north and are passing through our country on their way to a more genial climate.

One attractive bird which is frequently seen at this period is the common sandpiper, a summer visitor which I have described in an earlier chapter. The green sandpiper is a passage migrant though occasionally he spends the winter here. Sometimes he arrives in considerable numbers. He is a shyer bird than his cousin, and when he is disturbed he flies up at a sharp angle till he is high above the water and drops again at a safe distance. As he rises he

shows a conspicuous white patch on his rump. The wood sandpiper may also sometimes be met with at this season but much more rarely. It resembles the green sandpiper so closely that to the average observer the two birds are indistinguishable. But in bird observing you never know what your luck may be. The first time you see a sandpiper that answers the above description, you may get such a close and such a good view of it in ideal conditions of light that you may be able to identify it as the wood sandpiper by reference to a standard bird book, or to a specimen in a museum.

The white rump is the distinguishing mark between two other small waders. The dunlin is very common at this season and all through the winter, but other waders frequently consort with it. The ringed plover and the sanderling are the commonest of its companions, but during the period of migration individuals of several species which are on passage may also join the flocks. So every flock of dunlin should be carefully scanned with the hope of detecting one of these strangers. It was while watching such a flock feeding at the edge of the tide that I first saw that rare summer visitor the Kentish plover. The bill of the dunlin is more or less straight but in some individuals it curves downward slightly at the tip. The curlew sandpiper has a curved bill, as the first part of its name suggests, but otherwise it so closely resembles the dunlin in its winter plumage that it must often be overlooked by observers, who would be delighted to count it among their acquaintances. The flock should be watched till it takes to flight, and then if the curlew sandpiper is there, its white rump will show out boldly.

Among flocks of curlew, and also in separate flocks, you may see the whimbrel, a bird which I loved for its name

long before I saw or heard it. A few pairs of this species still nest in the Shetlands, but its true summer home is in the Færoes, Iceland and northern Europe, and it passes along our coasts on its way to and from its winter quarters, which range from the Mediterranean to South Africa. It is similar in build and plumage to the curlew but smaller, so when the two birds can be compared they may be distinguished by size. When you see them apart you must depend on other signs. One is the call. The common cry of the curlew is *wha-up*, a two-syllabled whistle rising on the second, and the whimbrel's is *te-te-te-te-te-te-tet*, one note repeated several times; the number is generally supposed to be seven, but is often only five or six. The special badge of the whimbrel is obvious when the bird is at close range. It consists of two broad, dark brown stripes that pass from the beak to the back of the head and are separated by an equally broad light strip.

The greenshank is a summer visitor to some parts of Scotland, but is a passage migrant in the rest of the country. Frequently it feeds among redshank, so you may pass it unawares unless you know the outstanding characteristics in which the two differ. It is not always possible to see the colours of the legs, but when it is they are distinctive. The redshank has a straight red beak with a black tip; the greenshank's beak is black and is slightly upturned. The greenshank is the larger of the two, but it is most easily recognised by its call. Wherever you may go on the marshes you will hear the beautiful plaintive notes of the redshank, *tyu-hu, tyu-hu-hu*. The greenshank's call is one note repeated three times clearly and sharply, thus, *chu-chu-chu*. Further, the general colouring of the greenshank's plumage at this season is lighter than the redshank's, and when he rises from the ground he shows a conspicuous white rump and

tail and no white on the wings such as the redshank displays.

On the lowland marshes you may also meet with the jack snipe. In such localities we expect to see the common snipe at all seasons, but more plentifully in autumn than in spring, for many snipe nest on the uplands and moors and spend the rest of the year on lowland and salt marshes, where they frequently gather in companies or "wisps." When the common snipe is disturbed it rises at an angle of about forty-five degrees with an alarm note that sounds like *snape*, and goes off in a swift zigzagging flight as if it were expecting to be shot at and were trying to spoil the aim of the sportsman or to dodge the missile. The jack snipe, which is a smaller bird (the term jack being a diminutive), rises at your feet silently, does not zigzag, and drops after flying a few yards.

Two more waders of special interest are the bar-tailed godwit and the black-tailed godwit. The latter is one of our lost British birds. We may still call it a British bird in the sense that we may see it every autumn while it is on passage if we look for it regularly in the right places, but formerly, and even so recently as the middle of last century, it nested in this country. Now it is rarer than its cousin the bar-tailed godwit, which is actually more of a British bird in that, though it has never nested in Britain, it frequently spends the winter with us and can therefore be counted among our winter visitors, besides being one of our regular passage migrants.

There is a slight difference in size between the two, the black-tailed being the smaller, but they are tall, approaching the whimbrel and the curlew in proportions, and at a distance might be mistaken for these birds. The most obvious distinction between the two types is the form of the bill. All four birds have exceptionally long bills, but while those

of the curlew and the whimbrel are curved downwards like a sickle, those of the godwits are almost straight, but are slightly upturned towards the tip. The names bar-tailed and black-tailed give a clue to the identification marks of the godwits themselves. The most conspicuous feature of the bar-tailed godwit, however, is a white rump, and the bird may be further described as having a white tail which is crossed by a series of narrow black bars. The black-tailed godwit has a dark grey rump, and its tail is black except for a broad white band at the base and a narrow one at the tip. These birds may be seen feeding on the mudflats in estuaries and on sandy beaches, the bar-tailed on all our coasts, the black-tailed rarely in the west. Sometimes godwits visit inland marshes, even in the neighbourhood of London.

Another of our lost British nesting birds which is now only a passage migrant, is the black tern. This bird may be recognised as a tern by its form and distinguished from other terns by its dark grey upper parts. It feeds on insects which it captures on the wing or while they are resting on the surface of the water, so it does not plunge to secure its prey as do other members of its family. It is to be seen chiefly on the east and south coasts of England, but sometimes visits inland lakes and reservoirs.

A passage migrant of another type is the bluethroat, a member of the thrush family and a close relative of the nightingale. In its spring plumage this bird's throat and upper breast are a beautiful metallic blue with a large chestnut spot in the middle. As we see it in autumn the blue is reduced on the chin and throat, but there is still enough to be conspicuous when you get a good view of the bird. A more useful mark of identification is a chestnut patch on the upper half of the brown tail. It is a difficult bird to see, for it skulks among bushes and other rough vegetation, but

a quick eye may identify it as it flits, usually low down, from point to point. On this account there is all the more fascination in searching for it and satisfaction in tracking it down. It passes along the east coast route between the middle of September and the middle of October.

A number of rarer birds also use our coasts on passage, some regularly others irregularly. They are recognised British birds and any day in the proper seasons we may have the thrill of meeting with one or another of them; but the lengthy descriptions of them printed in standard works tend to give them undue importance. Some of them owe their inclusion in the list of British birds to one or only a very few records. This scarcity of reliable records may perhaps be accounted for by the paucity of good observers in the past. A considerable number of the species are represented by skins of birds picked up dead or shot by curious gunners, so it is possible or probable that many more individuals of some or all of them have passed through this country than have been identified. As experienced observers increase, therefore, we may hope that records of our rarer migrants may become more frequent.

During its earlier stages the autumn migration of birds is just a gradual drift southwards, the young moving first and the adults following later. But at some mysterious signal it suddenly develops into a series of great, rapid rushes. What this signal is, is not yet understood, but as it affects the birds throughout an enormous area at the same time, it is probably a subtle change of climatic conditions which is felt and acted upon by these sensitive creatures almost before it is represented to us by a move in the barometer. The first to feel the impulse are the summer visitors, which leave in great waves during September. By the end of that month nearly all of them have gone.

Individuals of a few summer species may be seen in the early part of October, and though it is possible that these may be passage migrants, most observers have records of house martins feeding young in October. Probably every year some pairs of these birds are forced to abandon nestlings which they have hatched too late.

The movements of the passage migrants begin later. I have myself seen whimbrel in Cornwall on the 15th of July, and several other waders appear regularly in August. The drift becomes more general during September, but the great rushes of the passage migrants take place in October. Naturally we wonder how these passage migrants are able to distinguish between the signal on which they themselves must act and that to which summer visitors respond. Perhaps the earlier signals bring them across the North Sea, and then, finding the country more or less deserted, they settle down for a time until the next mysterious impulse stirs them to move on. But whatever the explanation may be, the phenomenon offers scope for some enterprising and enthusiastic investigator.

Some weeks before the passage migrants begin to go, our winter visitors begin to arrive. A few of them may actually come in August, but it is impossible at that season to distinguish between those individuals of certain species which are going to pass on farther south and those that will remain here throughout the winter. Indeed some of our birds which are known as all the year round residents, the starling, for example, are also summer, partial, passage and winter migrants. So when we see grey plover, turnstone, knot, sanderling or bar-tailed godwit in August, we cannot take the record as evidence that winter migration has begun. These birds are all recognised winter visitors, but they are also passage migrants. In the second week of September

we may expect the snow bunting on the seashore and the scaup duck and the common scoter in the neighbouring sea, and we may fairly assume that these are the first of the winter migrants. Even they are also passage migrants and the individuals we see at this period may pass on, though we may record the species in the same localities every week for the following six or seven months. About a week later, however, several kinds of wild geese arrive and take possession of the quarters which they have occupied every winter since time immemorial. Before the end of the month the redwing and the brambling may appear and early in October the fieldfare, and thereafter the winter visitors will continue to pour in, for several weeks, in increasing numbers. In normal years this flood of immigration comes to an end about the middle of November, among the last species to arrive being the wild swans.

CHAPTER THIRTEEN

PROBLEMS OF MIGRATION

The more one knows and loves those beautiful creatures of the wild, the more the desire grows in one to understand the mystery of their migrations, or at any rate to come into closer touch with them than is possible by reading books. Then among the expeditions planned for the next year comes one or more to places where we may be able to witness the great movements actually in progress. As most of the flights are made at night and at high altitudes, they are not easily observed, but people who live on one of the recognised routes, and among them are Londoners, may sometimes, when the air is still, hear the jingling keep-in-touch calls of the flocks as they pass overhead in the darkness. Such an experience gives one a peculiar thrill: it is like watching the passing of ships at night. Much more

satisfaction is derived from actual observation of the travellers. This can be accomplished at many parts of the coast where the passage migrants and the winter visitors arrive, or pass on their great journeys to and from summer and winter quarters. With luck you may see the flocks alighting in the morning to rest after their long journey overnight.

It was in the hope of securing some records of these incoming migrants that I made my first visit to Norfolk. I selected Wells as a likely neighbourhood, and on my way thither I called on a friend in Hunstanton. While walking along the front there I noticed several remarkable things, but did not fully understand them until next day. A flock of rooks came from behind the town and a little later they were followed by a flock of lapwings. This happened twice and I thought, "Surely those birds are very restless; something must be disturbing them on their feeding grounds at the back of the town." Then as they came again and again, I began to take more careful note of their movements. Every time they appeared they were flying fast and direct as if about to make for the opposite shore of the Wash, but when they reached the edge of the sea they changed their minds suddenly, turned sharp to the left and made off south-westwards along the line of the shore. This struck me as curious. Presently another flock of rooks came over, and, like the rest, went straight ahead until they were just over the water's edge. Then like their predecessors they checked. This time only a few turned to the left; the rest hesitated or rather several did, with the result that the flock fell into confusion, some apparently wishing to go one way and some the other. At length one bold spirit set out in a determined manner for the Lincoln coast, which could just be seen dimly in the distance. He proceeded for some time alone, then encouraged by his strong will and fearless

self-confidence, two followed him, then three or four more, and gradually the rest of the flock trailed off in his wake. It was an interesting lesson in leadership, and as I had never before seen land birds deliberately start on such a long oversea journey, it set me thinking.

Next day at Wells, some twenty miles distant, I went out on the marshes and there I found the explanation. All day long I saw flock after flock of rooks and lapwings, often several in sight at one time, following each other in procession from east to west, that is, in the direction of Hunstanton. Here was what I had come all this way to see. I was witnessing one of the grand things in Nature, bird migration actually in progress on a large scale. The birds had no doubt arrived earlier in the morning at some point farther east or south, and were now spreading themselves west and north over the available feeding grounds. The following day it was just the same. Thus this great movement of these two species lasted for at least three days, and it may have started a day or more before I first noticed it. But in the evening of the third day the wind changed, and when I went out once more in the morning the pageant had ended, and the only rooks and lapwings in sight were those that were already in possession of the marshes and the adjacent fields.

My first expedition had been a success, though I had seen only one small part of the great migration. I have since made others, some successful and some unsuccessful, and I hope I may be able to make many more; for, apart from the spell that is cast by those passing multitudes of travellers from foreign lands, like the call of the sea and the romantic going and coming of ocean-crossing ships, I have always a hope that next time something I may see may throw a light on the whole fascinating problem.

One of my successful expeditions was a voyage from London to Dundee at the beginning of October and back again a fortnight later. On the northward trip I saw few signs of migration except the presence, as far south as Scarborough, of the Arctic skua. Terns were still plentiful along the coast, but no doubt were moving gradually southward, and the skuas were reaping a rich harvest as they passed. At the mouth of the Tay I saw, among other winter visitors that were already well established, an enormous flock of eider duck, a sight for which alone it was well worth while travelling all that distance.

On the southward journey we sailed through a broad belt of migration, which was probably another phrase of the great annual immigration of winter visitors that I had first witnessed at Wells and Hunstanton. The birds come from eastern and central Europe and cross the North Sea between Holland and the south-eastern counties of England. Unlike the travellers on the other highways, they perform the ocean voyage by day, and thus this route affords better opportunities for observation than any other. On this occasion it brought me into direct touch with the problem of how birds find their way across the ocean. From 9 a.m. onwards a hen chaffinch was more or less on board the ship. I did not see her first arrival, so it is possible that she had been one of us for an hour or two longer. I presumed that she was a Scandinavian traveller and had been deceived by the ship when within an hour's flight of her destination. Several times during the afternoon she tried to leave us, either when we passed a lightship or when another steamer going northward had passed us and in the distance appeared like a stationary object. But she always returned after a few minutes.

About midday, when we must have been somewhere off

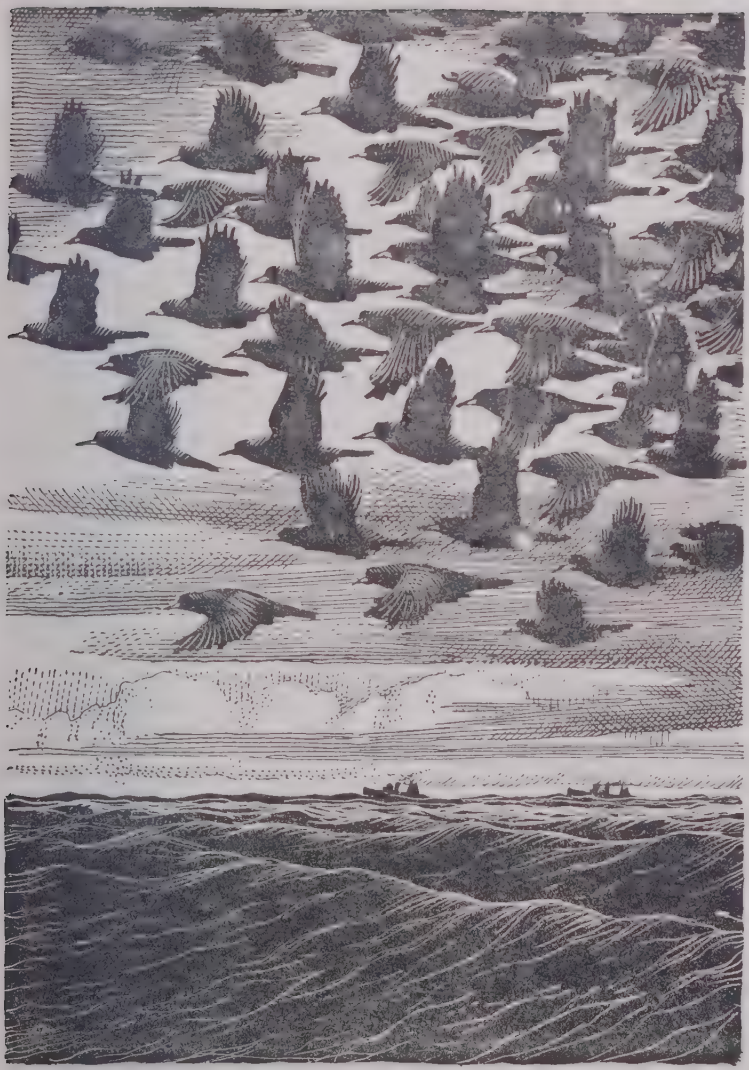
the Yorkshire coast, our passengers were increased by the arrival of two starlings. Then at lunch the captain announced that he "didn't like the look of things; there were far too many land birds about." I pressed him at once for an explanation of this and he said, "When you see land birds on the ship you may be sure the weather is calm and hazy," the implication being that hazy weather might develop into fog.

Throughout the rest of the day I noticed flocks of rooks or other members of the crow family and starlings travelling in a north-westerly direction towards the coast, which was about fifteen miles distant and hidden by the haze. They were flying at no great height above the sea, indeed, very much as they do over land, just high enough to carry them easily over the tree tops, and they showed no signs of hurry or fatigue. If, as seems probable, they had come from the mouth of the Rhine or from the north of Holland, they must have flown a hundred miles or more, and yet they were going steadily forward with that slow, measured wing-beat which is typical of birds on migration and suggests that they have ample reserves of power. They reminded me of a long-distance runner who has settled into his stride and covers lap after lap at one even pace, and of the navvy who works all day with a pickaxe by going easily instead of wearing himself out in an hour by striving to beat the record.

The flocks seemed to be in no way affected by the appearance of ships, and even small parties and pairs passed overhead without showing any sign that they had noticed us. But some pairs and a number of single birds alighted on deck or rigging, and those that did so lost all sense of direction. For example, a couple of starlings flew to us from a lightship which was a mile or two nearer the shore

than we were. They remained with us for some time and then went off to try other ships. A single rook alighted on the flagstaff at the stern, sat there for a few minutes and then instead of making for land, set off northward in pursuit of a steamer that had passed us some time before and was already several miles astern. On the other hand, a couple of rooks, which had been on board for half an hour, left us to join another pair which passed confidently overhead in the direction of the coast.

In the behaviour of those that alighted, there was no evidence that the birds were exhausted. My impression was that they had first lost confidence and so had sought the nearest resting place, and then having done this, they had become confused. Those that retained their self-confidence continued on their way unbiased by the appearance of ships. This is probably one strong reason for migrating in flocks ; the company gives the birds confidence. Yet small groups and couples and many single birds had accomplished the greater part of the journey successfully, and would have reached land in less than an hour if they had flown straight ahead instead of diverging to the doubtful security of the ship. If the haze had developed into a fog, many more of the migrants would have gone astray, and if the weather had been clear, none of them would have been tempted by a ship. It is well known that on foggy and misty nights birds are lured to death by the lanterns of lighthouses and lightships but are not seen near the lights when the air is clear. This shows that to some extent at any rate, birds depend on their eyesight during their oversea flights. My own observations suggest that once they start they can keep on in the same direction so long as the phenomena on which they depend for guidance remain constant, unless they lose confidence in themselves



Rooks on Migration

through being deprived of some or all of the benefits of eyesight by haze or fog, and that the moment they abandon their original course they are as completely lost as a ship without a compass. In other words the popular idea that birds have a sixth sense which has been specially provided to enable them to find their way over trackless oceans, is not supported by the available evidence.

Another of the problems is the fluctuation in the numbers of the migrants from year to year. In some seasons there may be more or fewer swallows, willow warblers or corncrakes than usual. In one winter bramblings, siskins or mealy redpolls may be plentiful and in the next they may be comparatively scarce. This variation may be widespread or it may be only local; individual observers may notice scarcity or abundance in their own districts, but if a census could be taken for the whole country, it might be found that years of scarcity in one area were years of abundance in another. In my own experience one period of abundant bramblings was also a season of a bounteous beech harvest. Was this only coincidence, or do the bramblings arrive in Great Britain in equally large numbers every year and pass on when the beech-mast fails, or is there something in the conditions that produce a good crop of beech nuts here, which affects the food supply of the bramblings elsewhere or otherwise reacts in such a way as to cause them to migrate in exceptional numbers to this country? Obviously they cannot be aware of the state of the beech harvest before they reach our shores.

The answer may perhaps be found in other phenomena. The brambling is a regular visitor. In certain seasons rare passage migrants appear in this country which may not have been seen here for years. It is possible that some of them come every year but that more often than not obser-

vers fail to notice them. There is reason to believe, however, that when easterly winds prevail during the autumn migration period, some species which usually travel southward by the continental route are carried out of their course and thus reach our shores.

Apart from such casual fluctuations there are some very remarkable periodical immigrations of species which otherwise are rare visitors to this country. The year 1927, for example, was a great crossbill year. This is a European bird which lives and nests in coniferous woods. It is not indigenous to this country, but is one of our regular visitors, though usually it comes in small numbers. Strictly speaking, it is a winter visitor and passage migrant, but it arrives in summer from about June onwards. This is accounted for by the fact that it nests very early in spring. Most of the birds that come here are young birds of the season. Periodically, on an average of about every eleven years, it comes in great numbers and may then be seen in most parts of the country. In the spring following one of these "irruptions" some pairs may remain to nest, and it is probable that if it were not persecuted the bird would become established as a resident species, especially as coniferous woods are now growing up everywhere. In recent years it has actually become a resident in Ireland. This, the common crossbill, must not be confused with the Scottish crossbill, which differs from it in the size and form of the bill and in the fact that it is not migratory.

Another bird which comes periodically in considerable numbers is the waxwing. This is an Arctic species which in some years visits us in small numbers and in others not at all. When it does come, it arrives in November. While it is here it feeds chiefly on wild berries and is recognised by its conspicuous crest.

A third bird which invades this country at irregular intervals, sometimes in large numbers, is Pallas's sandgrouse, a species which resembles the pigeon in general appearance and habits but has a bill like that of a grouse. It nests in the sandy deserts of central Asia, and at intervals which average about eleven years, spreads westwards across Europe and reaches the British Isles. Apparently none of the birds ever makes any attempt to return to its native regions, but the probability is that few ever get the chance. Some pairs have actually nested in this country.

The migration of the sandgrouse would seem to be an attempt at colonisation by young birds which have made their escape from overcrowded areas. It is possible that the periodical invasions of the crossbill and the waxwing are similar in purpose and origin, though the overcrowding of the waxwing may sometimes be due to failure of its natural food supply.

The original cause or causes of migration may for ever remain a mystery. I am sure they will so long as we allow ourselves to be hampered by the convention which science substitutes for Providence. To me there is no mystery in the southward movement of birds in autumn. The chief difficulty is that young birds which have never been more than a mile or two from their birthplace, combine in large companies and, apparently without guides, venture forth on a voyage across hundreds of miles of uncharted ocean and in most cases reach safely their unknown destination. The rule in most species seems to be that the young go off days or weeks in advance of the adults, but young cuckoos are left behind by their elders and follow as best they can some weeks later, and they travel not in flocks but alone. That is a puzzle, but we may make too much of a mystery of it. Conditions become unpleasant and birds use their

wings to escape from them. Other forms of animal life which cannot escape and are consequently faced with starvation, solve the problem by hibernating. The retreat of the birds has happened regularly at the same season for ages past and has become so ingrained in their nature that at a first or a later warning of the trouble to come, they move off actually before there is any real need for them to go. It is clear that this retreat is enforced on insect-eating birds by the rapid diminution of their food as the various kinds of insect make their annual preparations to meet the winter. Obviously most of these birds could not survive if they were to try to pass the winter here, so they must go. The fact that they "remember" to go, though they are young and have never made the journey before, and that they follow the ancestral route without guidance though they may be using it for the first time, is no more a miracle than the miracle of memory itself. Other species which also leave the country, have no such compelling cause for making the voyage. Large numbers of birds which are hardy enough to spend the winter in this country and would find ample supplies of food if they were to remain here, go southward in autumn. On the surface this looks like a mystery, but when we realise that their places are taken by others of the same or related species which come in from farther north, we have no difficulty in understanding that they are all moving away from relatively unpleasant conditions, which may become unbearable as they have often done in the past.

The real puzzle of migration is why the birds, when they find quarters that serve them well in winter, are not content to remain there for the rest of their lives. If we think only of south and north migration, we may look at the map and argue that as most of the land surface is in

the northern hemisphere, birds driven southward in autumn from this great expanse will be squeezed into a number of more or less narrow peninsulas and that this will cause them to explode northward again at the first possible opportunity. Or we may look at the sun and argue that birds of the temperate zone driven southward into the Tropics in autumn, will find its heat unbearable as it returns in the early months of the year and that this likewise will cause them to explode northward. Or we may put the two together and consider that with their combined effects we have solved the problem. But neither of these influences operates in the great east and west migrations which are such a marked feature of the bird life in the British Isles. These movements actually involve a north-westerly voyage in autumn, which is contrary to the stream of retiring summer and passage migrants, and a south-easterly voyage in spring, which is contrary to the stream of returning summer and passage migrants. In fact it is possible to see flocks of the same species travelling across the North Sea in opposite directions and passing each other in mid-ocean, the one apparently intent on following the sun and the other equally intent on getting away from it. Neither do the two great forces already considered affect the many streams of short distance, or, as it is called, partial migration, which take place within the bounds of the British Isles. But there is one potent factor which is common to all the spring migrational movements of birds and that is the love of the individual for his native heath. He is driven away from it in autumn by the approach of winter, but he returns to it as soon as possible. The swallow that nested or was hatched last year in Aberdeen comes north again in spring with others and crosses the English Channel. But when he reaches Kent he has a choice of thousands of eligible

territories and has no need to go further. Nevertheless, he wastes no time in disputing their possession with the owners or even in ascertaining whether they are occupied, but pushes on past tens of thousands of others till he reaches Aberdeen again. However this passion was implanted in his bosom, there seems to be no doubt that it is the ruling factor in his spring migration. It affects with equal force the starling, rook, duck or finch which has wintered in England or Ireland and whose summer home is in central or eastern Europe.

This is not just a pretty fancy; it is a proved fact. And it is not difficult to believe, because birds of well-known species have everywhere been recorded as having occupied the same territories or even the same nesting sites for a period of years, and in many instances for generations. Every dweller in the country knows that swallows, house martins and swifts nest each spring in the same barn or under the same eaves, though there may be many other buildings in the neighbourhood which seem to be equally suitable. We have all assumed that the same birds return year by year. Ringing has confirmed this, and has shown that young birds not only find their way back to the district in which they were reared but to the actual cottage under whose eaves they were hatched. Whatever we may think of the southward journey performed unguided by young birds which could not possibly have any knowledge of the route, the return to the very thicket, or garden or gable where they first saw the light can only be described as an astonishing feat of memory.

Beyond this, as we watch or listen to the passing flocks, we cannot help wondering whence they come and whither they go. We know the regions in which our winter visitors and passage migrants spend the summer months, because

we have been able to track them to their nesting haunts in the far north. About sixty species come from Greenland, Iceland and the Færoe Isles, over a hundred from Scandinavia and northern Europe, four from Spitzbergen, six from Novaya Zemlya and at least three from northern Siberia. The curlew sandpiper nests in one part of northern Siberia and nowhere else, but in winter after passing along our coasts, he may travel as far as South Africa, though he may go no farther than the Mediterranean. Several species of geese, several species of duck, several species of wader, and a number of others come from Greenland, travelling by way of Iceland and the Færoes. The whooper swan comes from Greenland and Bewick's swan from north-east Russia and Novaya Zemlya. The Arctic tern, which is a regular summer visitor to our shores, also nests within the Arctic circle and in winter has been seen by explorers or whalers well within the Antarctic Circle.

We are beginning to learn something also of the winter quarters of our summer visitors. When Gilbert White wrote his *Natural History of Selborne* he believed that swallows, like frogs, hibernated in the mud at the bottom of ponds. We have known for many years that they actually retire to Africa, but to what parts of Africa our own English swallows go remained a mystery until the ringing of birds was undertaken systematically on a large scale. This method consists in placing on the leg of a bird an aluminium ring with a name and number stamped on it for identification, such as have long been used by owners of homing pigeons. Many thousands of these rings have been attached to swallows by keen bird observers in this country, but only a small percentage of them have been recovered. This was to be expected, for it is only when a dead or wounded swallow is picked up that the ring will

be noticed. The large majority of those that have been recovered, however, have been found in the eastern regions of South Africa. We cannot say that all English swallows go to those countries, for at least one has been identified in West Africa at a season when it must be presumed to have settled down for the winter. Neither can we say yet by what route our English swallows travel to the south-east of Africa, but as the number of ringed swallows increases and Africa becomes more civilized, records will come in from various points along the line which the flocks follow year by year.

There are two quite obvious routes to South Africa and neither of them offers any serious difficulty to a bird. It would be possible for birds to travel from the north of Scotland to the Cape without ever losing sight of land, by crossing the Channel at Dover and the Mediterranean at Gibraltar. With the exception of these two crossings they would simply follow their noses throughout the whole journey along a well-defined highway, the coastline. If, instead of going by the shores of France and Spain, they were to fly up the Rhine valley and down the Rhone valley to the Mediterranean, they could proceed by Italy and Sicily, cross to Malta and Africa and thence by the Nile valley or the Red Sea to the east coast of Africa.

Where birds have to make long sea voyages during which they are out of sight of land for hours, we cannot help wondering how they manage to reach their destination. But when we examine such portions of their routes, we find that in most cases they have no real difficulties to face provided that they have sufficient endurance for the journey and can keep more or less in one direction for a prolonged period. If they leave Sicily or Sardinia and fly on a southerly course, they will eventually strike Africa

somewhere. When birds set out from the south-west corner of Scandinavia they will arrive somewhere on the east coast of Great Britain if only they fly steadily in a south-westerly direction. In fact, they do arrive anywhere between the Shetlands and the Humber. There is reason to believe that many of them actually miss Great Britain and, passing westward either perish in the Atlantic or reach the north or the west coast of Ireland. Whether any perish at sea in the ordinary circumstances through steering a wrong course and missing their landfall is not known. It is possible that certain tribes of various species avoid Great Britain intentionally and travel regularly by the Irish route. At any rate, those birds which do reach the west coast of Ireland, whether accidentally or otherwise, give us reason for wonder when they leave it, for some of them at least take off from the south-west corner and, travelling on a south-easterly course, reach the coast of France or Spain. Here of course it is the change of direction that surprises us; but what can we think of those birds which without any previous knowledge of the route leave Greenland, fly to Iceland and then to the Færoes and the Shetlands? The passage to Iceland is easy to understand; if they travel in a south-easterly direction they are bound to reach it at some point. But the Færoes are just a speck in the midst of an enormous expanse of ocean; it would seem impossible that such a bird as the wheatear or the meadow pipit could ever reach them except by the merest chance. Yet the more we learn about migration the more we are forced to believe that in ordinary circumstances the majority make the passage safely.

Ringing has also shown that starlings reared in this country do not migrate from the British Isles and for the most part remain in the districts where they were reared,

though a number go westward into Ireland and the Hebrides, or pass from northern to southern districts. It has also demonstrated that the hordes of starlings which come from northern, eastern and central Europe to winter in this country, return to their native lands in spring. Possibly some remain to breed, but this has not so far been established by the evidence of ringing.

The same would seem to be true of the common wild duck or mallard. The mallard, which nest in a particular area, remain there throughout the year, but their numbers are increased in winter by immigrants from the north and east which leave in spring.

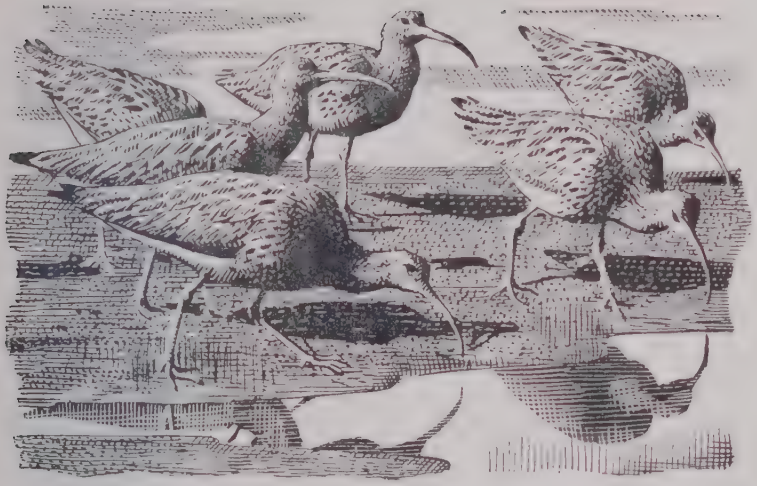
It is more difficult to record the migrations of sea birds by observation than those of land birds. A land bird that is seen travelling in flocks along the coast or crossing the sea is obviously migrating, but sea birds doing the same thing may just be repeating their daily practice. By ringing, however, we have made some interesting discoveries about the winter movements of our sea birds. Both herring gulls and lesser black-backed gulls spend the winter in this country, but one of them is migratory and the other is not. Our native herring gulls move southwards in autumn but remain on or near our own shores. Our native lesser black-backed gulls leave us altogether in autumn and spend the winter on the coasts of the Iberian peninsula and north-west Africa, their place being taken in this country by flocks which come from farther north.

The lapwing is another bird which is always with us, or so we think, but ringing has shown us that we must modify the "always." It is well known that this bird leaves the higher ground on which it nests and spends the autumn and winter on marshy land in the lowlands or near the sea, also that vast numbers of lapwings come here as winter

visitors from abroad. By ringing we have learnt that some of our native lapwings remain in this country all the year round and cling to the district in which they first saw light, but that many reared in the same neighbourhood, at any rate among those of Scotland and the north of England, move into Ireland for the winter, while others journey to Portugal and even as far as Morocco.

In this respect the lapwing is not unique. As I have already said, in other species such as the thrush, the blackbird and the robin, some individuals are all-the-year-round residents in this country, while others spend the winter abroad and are therefore summer visitors, and others again are winter visitors from northern Europe. It is probable also that among the residents some are stationary, that is, they remain constantly in their native district, while others move south or west for the winter and are therefore partial migrants.

This method of research is only in its infancy. Many individuals of all our species are ringed every year, but owing to the manner in which most birds meet their end, the percentage of the rings that are afterwards found and reported is very small. The more that are ringed, therefore, the more rings will be recovered and the more information we shall gain regarding the migrations and wanderings of our birds.



CHAPTER FOURTEEN

BIRDS IN WINTER

WINTER is a season of long, dark months bringing colds and other tribulations in its train, but none the less a season of warm fires, bright rooms, and mirth and jollity for most of us. But out in the wilderness it is a stern struggle for existence against the blind forces of Nature, with want and pinching hunger almost a certainty and starvation a probability. Last spring millions of young birds of all species were hatched, reared and sent forth to seek their fortunes, and next year the number of nesting birds will not on the whole be greater than it was before. In the interval millions will have perished, some by accident on migration, others at the hands of various enemies, some by starvation brought on by snow or frost binding up their food supplies, and others by sheer stress of weather.

When the winter is mild the birds do not suffer severely, There is plenty of food for them all so long as the weather is open. After such a season, if it were possible to take a census of them in spring, we should find that their numbers had slightly increased. But when the winter is long and bitter, the destruction of bird life is appalling, and some species are almost exterminated. In such circumstances none but the very hardiest can survive.

In the winter of 1916-17 our long-tailed tit and goldcrest were destroyed in such numbers that when nesting time came they were scarce birds. But their powers of recovery are such that in a few years they were as plentiful as ever again, and their numbers remain about the same from year to year. In other words they have reached what is called the balance of nature. As I have already shown, this balance is not struck in spring and summer, the seasons of productivity, but in winter, the season of waste. During this period while food is scarce and growing scarcer, birds do not compete for it; they combine in flocks and help each other to find it.

This habit of living in company is a common practice among those birds that remain with us. I have already described the formation and growth of the great starling flocks and drawn attention to the departure of the lapwings from the upland fields. In July and August the lapwings arrive in the lowlands and on the coast, and there they frequently meet and feed amicably with flocks of golden plover during autumn and winter. The seashore is the refuge of such marsh and moorland birds as the curlew, the redshank and the snipe. These species seem to find an unlimited supply of suitable food on the mudflats that are left bare twice a day in the estuaries of our rivers and on sandy stretches of foreshore. As this ground is never frozen, the

problem in winter is a simple one for them except in prolonged periods of severe cold, or in wildly stormy weather when they may be destroyed by exposure or exhausted by the overpowering buffetings of the wind.

In August the tits, which during the nesting season were seen in pairs, flit about in families or little bands. Chattering noisily, they will settle on a bush for a few minutes, then flutter away restlessly to a neighbouring tree, calling to each other *see-see-see* as they go. That calling as they fly is a common habit among birds. It enables them to keep together and is especially useful when they are moving about among the tree tops, where they may easily lose sight of each other, or when they are travelling by night. In September each party of tits will consist of one species and probably represents one family, perhaps two or more broods of one pair. But as time goes on several of those little bands join company, and throughout the winter you may meet with mixed flocks including four or five species of tit. Whenever such a flock settles near you, you may expect to see one or two tree creepers close by. At first I thought this was merely a coincidence, but I noticed it so frequently that I began to watch their movements more closely, and I discovered to my amazement that the creepers live among the tits as equals. When the flock alights and the tits busy themselves among the branches, the creepers drop to the base of a neighbouring tree and climb up and round the trunk, then fly down to the foot of another. But as soon as the tits decide to move on the creepers join them, and off they go together. I have also many times seen golden-crested wrens, and even nuthatches, in company with tits and creepers. There must be some common tie that draws these different families together, and they must be able to understand each other as far as that is necessary. They are

all small and all insect-feeders, and possibly they are not very distantly related, but in any case the calls they use are very much alike. Great tit, blue tit, cole tit and marsh tit say *see-see-see*. Long-tailed tit, creeper and goldcrest insert an "r," making it *sree-sree-sree*, but in all seven species the pitch is the same.

The partridge lives in families, or coveys as they are called, and as they often spend hours in one field and move slowly, it is possible to see everything they do, especially if you keep hidden and use field-glasses. Towards the end of winter, if a covey has not been destroyed by sportsmen, you may see many amusing incidents, for then the father begins to drive off the young cocks. He deals with them one at a time. At first the youngster is unwilling to go and flies only a few yards. There he alights and feeds with a show of indifference, but with one eye constantly on the covey lest it should withdraw treacherously and leave him alone. But when the family runs off at the first sign of danger, he follows shyly, and if the danger becomes pressing and the covey flies over the hedge, he joins the others unnoticed in the general excitement. He is soon driven off again, and gradually he comes to understand that it is quite possible for him to live an independent life. It is noteworthy that the old cock makes no attempt to drive his son out of the territory. All he does is to show the youngster that his company is no longer agreeable. He may remain in the same field if he likes and help himself to any food he may find there so long as he is content to live apart.

Larks, linnets and other birds live in larger bands, and each kind has its own ways of wandering. It is easy to recognise the larks as they cross the fields. They rise in a straggling flock a few feet from the ground, sometimes as much as twenty feet when they wish to cross a hedge or a

road, and, with a pretty fluttering of the wings and a chorus of sweet little trills, move on a short way and then settle almost as suddenly.

In some species it is the custom for the cocks and hens to spend the winter in separate flocks. This is most apparent in the case of the chaffinch. It is not unusual to see a large company consisting of none but cock chaffinches. These seem to be chiefly foreign birds which have come from northern Europe to winter here, and they will leave us again in spring. But mixed flocks, including several finches, and both male and female, may often be seen. They feed on stubble or ploughed land, and fly up to neighbouring trees in an excited, chattering cloud on the approach of danger.

Among larger birds the rule is for each species to keep to itself. Even when several kinds may be feeding on the same ground, each quietly shakes itself free from the others when they are disturbed, and all go off in their separate bands. An exception to this is the frequent mixing of rooks and jackdaws, or rather of jackdaws with rooks.

Rooks, jackdaws and crows may be seen together on the same field or marsh. These birds are with us all the year round, but it is one thing to know them at their nesting places and quite another to recognise them in their winter quarters. According to the reference books the rook has a white patch of bare skin at the base of the beak and the crow has not, and the jackdaw is smaller than the other two and has grey on the back of his head and neck. Unfortunately these rules are not always enough to enable you to identify the birds in the open air. If you see a black bird that is large enough to be a member of the crow family and can be sure that it has the white bare skin at the base of the beak, you may be satisfied that it is a rook. But sometimes the

light is deceptive, especially when the bird is at a distance, and causes you to think you see a white mark where there is none, and so you may believe a bird to be a rook though it is really a crow. Besides, not all rooks have the white patch, as I have shown in Chapter Eleven. So you may often see birds that seem to be crows though they are really rooks.

The rook's beak is straighter and more slender than the crow's. When he is on the ground some of the rook's feathers hang down round the upper part of his legs in such a way as to suggest that he is wearing knickerbockers or shorts. The crow's feathers all fit close to its body.

A readier means of distinguishing the two is that the rook flies and feeds in flocks and the crow singly or in pairs. But even this is not always to be depended upon; for often you may see a solitary rook flying overhead or sitting on a tree or searching for food, and it is not uncommon in autumn and winter for crows to live in parties.

The rook alights on the ground and walks about in a stately manner, picking up tit-bits here and there as he goes. His food consists of little things, such as worms, grubs and corn. But the crow is the carrion crow, and his favourite meal is the flesh of some dead animal, so he flies about in search of some such prize and alights when he finds it. Still, while he is in flight he may easily be mistaken for a rook, and the rook sometimes eats carrion.

Once you know the calls of the rook and the crow you need never confuse the two birds. Most people are unable to distinguish these calls because they are not in the habit of noticing the sounds they hear, and their attention has not been drawn to the difference. The rook's is a deep, hoarse *ca-a-aw*, and the crow's is a harsh *car-r-r.* The crow usually sounds his three times in quick succession, thus *carr-carr-carr.*

Unfortunately the carrion crow's call is the same as the hooded crow's. So when you hear it, though you need never mistake it for the call of the rook, you cannot be certain that it has been uttered by a carrion crow without actually seeing the bird. If you do see it and get a clear view of it, you will have no difficulty in deciding whether it is a hooded crow or not, for this bird has a slate grey body and black head, wings and tail.

Another species that may be mistaken for the carrion crow is the raven. This is a larger bird and has a much heavier bill. But at a distance you cannot depend on size as a guide, and in that case the only sure test is the call note. The raven's call is quite distinctive. It is a deep *cr-r-ruck*, which is uttered repeatedly. The raven lives in mountainous districts and on the coast, where there are inaccessible rocky cliffs on which it can roost and rear its family in security. It is in such districts only, therefore, that you are likely to confuse the raven with the crow. In other parts of the country the raven may be ruled out when you have any difficulty in identifying a member of the crow family.

Everywhere, however, the jackdaw is extremely common, and in flight he may be easily mistaken for either the crow or the rook. He is the smallest of the tribe, but, of course, at a distance the smallness of the jackdaw is no better guide than the largeness of the raven. His wing-beats are quicker than those of his larger cousins, and they are one of the signs by which you may know him when you are familiar with the bird and have been able to compare his flight frequently with that of the rook. At close quarters the jackdaw may be recognised by the grey patch on the back of his head. But his call is characteristic, and he will never keep you waiting long for that. He is constantly repeating his own name, Jack, as if he liked the

sound of it. It is shorter and sharper than the call of the rook, and for comparison may best be represented by the syllable *kya*. But like most birds, the jackdaw has several calls, and one of them is not unlike the caw of the rook.

There is one more black member of the crow tribe, the chough, but it is rare.

The magpie and the jay also belong to this interesting family, but as each of them has a very striking plumage of its own, it is not possible to confuse them with any of their relatives. The magpie's black and white coat and his long black tail are unmistakable. His call is just as unmistakable, once you know it. It is a loud chattering cry, like *chac-chac-chac-chac-chac-chack* repeated rapidly. Naturally the magpie flocks in winter, and at one time parties numbering as many as twenty were to be seen in field and wood. Then the gamekeepers persecuted the species till it was reduced to isolated pairs. But during the Great War it was relieved from their attentions and was able to multiply. It is now fairly plentiful. I have myself had the pleasure of seeing six of these handsome birds on one thorn bush.

The jay is such a wary, shy bird that it is difficult to see him at close quarters. At the first sign of your approach, he flies off to a safe distance, uttering as he goes the harsh screaming note that has given him his name; it sounds like the tearing of a piece of cotton. It is seldom that you can get near enough to a jay to see the beautiful blue patch on his wings. But his reddish brown back with a large white patch on the rump and his black tail are conspicuous as he flies away from you. His manner of flight is also characteristic. It suggests that he is feeble, and when you see him crossing an open space you find yourself wondering whether he will be able to reach the farther side. This bird does not flock in summer, but it lives all the year round in

Flying Jay.

colonies, and at pairing time the members of such communities hold some noisy meetings in the tree-tops.

Our winter visitors arrive in flocks and for the most part remain in flocks while they are here, though some, such as our immigrant blackbirds and song thrushes, may be described as keeping together in very open formation. I always look for the first of the redwings in the last week of September and the first of the fieldfares about a week later. Both are cousins of our song thrush, but they are distinguished by the fact that they live in flocks. These flocks roam about the country all winter, and may be seen any day in the open fields and commons, and on hedgerows where they often alight to eat the berries.

The redwing is about the size of the song thrush, or just a little smaller, but if you see it close at hand you may know it by the fact that it has a broad white streak over the eye, and by the red on its sides; for its wings are not red. Its sides under the wings, and also part of the under sides of the wings, are red of a similar shade to that of the robin's breast. When the bird is at rest you may see a portion of this colour just in front of the wings, but when it is in flight it displays a flash of red at every beat. Often a flock of redwings will remain in one district for a long time, perhaps for the whole winter. In that case they will have some roosting place to which they will return every evening. My experience is that they spend the day eating haws, and that they prefer this to any other food, though they will hunt on the ground for worms and grubs like the other thrushes.

Fieldfares, as their name suggests, are birds that frequent fields. They are sometimes to be seen eating berries, but more often they settle in a field and feed there on worms and grubs. At such times they may be distinguished

from other thrushes, and especially from the missel thrush to which they approximate in size, by their grey heads and the grey patch on the rump. The latter is very noticeable when they fly away from you. They are wary, and when any one approaches their feeding ground they rise in a flock uttering their alarm call *tsack-tsack-tsack*, and settle on some tall tree at a safe distance, where they can get a clear view of their surroundings and so make sure that the danger is past before they descend again. When they do this they all sit in such a way as to look in the same direction, which is their practice also when they are feeding on the ground. It has been suggested that they always face the wind. They may do this frequently, but not by any means always, and when I have been the intruder they have never faced the wind if that would have meant presenting their backs to me. My impression is that their tendency to face generally in one direction has no relation to the wind but is just an instinctive preparedness, the outcome of their very intimate flocking habit. The practice may be noticed when they are feeding on the ground, especially soon after a flock has alighted, but when a flock has been in a field for some time the birds may be seen facing in all directions.

Besides the redwing and the fieldfare, a number of other birds are regular winter visitors to our islands. In fact we have as many kinds of winter visitors as of summer visitors. If you see a flock of little birds about the size of a chaffinch feeding on the ground among beech trees, watch them carefully, for some or all of them may be bramblings which, in spite of their name, seem to have a preference for beechmast. You will probably not be able to identify this bird by referring to the brambling pictured in the standard books, for that will show the summer plumage, which is not seen at its best in this country, and not at all till late

in spring, when the flocks are preparing to leave for their Scandinavian homes. Like other finches, the brambling wears a special winter plumage which is not shown in most books. The readiest means of recognising the bird are its white rump, which is displayed when the bird is in flight, and the chestnut patch on its shoulders. It often feeds among chaffinches, and when the whole flock flies up, the white rump announces its presence.

In this matter of winter plumage even the best reference books are misleading. Their selection of summer plumage can be understood so far as our resident birds and summer visitors are concerned, for it serves the purpose of those observers who are interested in birds only at nesting time. But it indicates that the publishers are old-fashioned and are catering for a public that began to disappear twenty years ago, or that the artists are not genuine outdoor naturalists. When only the summer plumage is given of birds which are winter visitors to this country and are therefore seen here in their winter plumage or (in spring) in a partial summer plumage, we must assume that the artist, if he be an Englishman, has never seen alive the birds he is depicting, and has no knowledge of the difficulties of those bird lovers whom his pictures are intended to help. An ideal reference book would show these birds most prominently in their winter plumage with a secondary figure in summer plumage, and would also include clear representations of the female plumage and of the first winter plumage of the young of all species in which this differs from that of the adult male. These female and juvenile plumages are of the utmost importance to observers of birds during the autumn migration and throughout the winter.

Another winter visitor is the snow bunting, or snow-

flake as it is sometimes called, which is a cousin of our well-known yellowhammer. This attractive bird is rare in some parts of England, but on the east coast from Norfolk northwards it is not uncommon. The male in his spring plumage is white with black markings on back, wings and tail. In his winter dress the black is broken up by chestnut markings and, in addition, there are chestnut patches on head and breast. But so much of the bird is white that it cannot be mistaken for any other, and when a flock rises and flutters along before you on hillside or shore, you understand at once why it is called snowflake.

Wherever birches or alders grow you should keep a sharp look out after September for flocks of redpolls and siskins. The lesser redpoll is a resident, but its numbers are increased in winter by immigrants from abroad and also in some years by many mealy redpolls from the far north. The two may be sometimes seen in the same flock and can be distinguished by the fact that the lesser redpoll has a buff bar across the wing and the mealy two white bars. In the same flock, but more frequently in separate flocks, you may see the siskin, which is easily recognised by the green and yellow plumage of the male. All three are very tit-like in their movements. They hang head downwards at the tips of the twigs to secure the tiny seeds of the birch and feed thus actively for a little, then suddenly and for apparently no reason except that it is a jolly thing to do and life is worth living, they spring into the air, as if on one spontaneous impulse, rush hither and thither above the tree-tops twittering excitedly the while, and then in a minute or two drop as suddenly into another tree (not infrequently the same one) and at once are as busy as ever again. Sometimes these birds may be seen consorting with a mixed flock of tits, tree-creepers and goldcrests. The siskin

seems to have a particular preference for the seeds of the alder.

On rocky parts of the coast, from Yorkshire and North Wales southwards, you may have the good fortune to see the black redstart. This bird is a regular passage migrant along our shores, coming from the east in autumn and returning eastward in spring, but it also remains in some numbers as a winter visitor and in recent years it has nested in several districts including London. The red tail shows its relationship to our summer visitor, the common redstart. Its head and body are black or grey and its wings dark brown patched with white.

Large numbers of skylarks, meadow pipits and reed buntings winter on those parts of the coast which are bordered by low-lying fields or marshes. There also you may see numbers of rock pipits, which may be distinguished by the fact that the outer feather on each side of the tail is grey whereas the same feathers on the tail of the meadow pipit are white. If you have a good ear you will also be able to recognise him by his call, which is harsher and more metallic than the simple *pip* of his cousin.

Like the brambling, the handsome male reed bunting in his winter coat is hardly recognisable, the velvet black of his head and throat being hidden by the buff tips on the feathers, and at all seasons the female and the young have quite a distinct plumage. Artists prefer to show the cock in his summer coat, so on your first winter visits to such parts you may be puzzled by what may seem to be a rare bird until you realise that it is only your old friend the reed bunting in disguise.

On the coast there are many birds of many species throughout the winter, especially where the foreshore is sandy or muddy. To most of us all gulls are very much

alike, and even to experienced observers their similarities present difficulties. But there is one outstanding feature of all the common kinds of gull by which they may be recognised except when they are flying or swimming. Whenever you see a gull standing or walking, look first at its legs. The colours of the adult birds are as follows:

Blood Red	Black-headed Gull
Black	Kittiwake
Greenish Yellow	Common Gull
Flesh or Pink	Herring Gull
Yellow	Lesser Black-backed Gull
Flesh or Pink	Greater Black-backed Gull

The first three are about the same size; the third and fourth are similar in the general colouring of the plumage; the fourth and fifth are about the same size, but the herring gull has a pale grey back; and the last two differ considerably in size but may be mistaken for one another when they are seen apart.

When the gulls are in flight, look at the wings for the following signs:

White fore-edge of sharply tipped wings	Black-headed Gull
Black-tipped, grey wings	Kittiwake
Black and white-tipped grey wings	Common Gull
Small white bar on black-tipped grey wings	Herring Gull
Black wings with small white tip	Lesser Black-back
Black wings with bold white tip	Greater Black-back

All the commoner gulls are plentiful in parts where they are rare during the summer, for they congregate in colonies at nesting time and scatter as soon as the young are reared. Indeed from August to March bird lovers will nowhere find better hunting than on the seashore. Lakes, reservoirs and marshes provide a variety of birds usually in large numbers and are well worth visiting frequently, but most of those species may also he seen on the coast or in the estuaries, either on the beach or in the water, in addition to the many birds peculiar to shore and sea. Our native curlew, redshank and snipe are there, and their numbers are greatly increased by the flocks from abroad. But there are others which are only winter visitors or winter visitors and passage migrants, and it is always with the hope of meeting with one or more of these that you should visit the seashore.

Among them is the grey plover which is similar in form and size to the golden plover but is grey instead of golden brown in colour. It is much more a denizen of the shore than its cousin and has a distinctive call, which is rather metallic and not nearly so pleasing as the liquid *tlee* of the other. The under sides of its wings are dark and show a black patch when they are raised in stretching or in flight; those of the golden plover are white. A few of these birds may be found here and there during the winter, but large numbers pass along our coasts in spring and autumn and then they may be seen in their handsome summer plumage, the chief feature of which is a white-edged black front extending from the eyes downward. In winter this conspicuous decoration is replaced by white.

The ringed plover may be in small flocks by themselves and the dunlin in small or large flocks also by themselves. But many flocks are mixed and may consist of

dunlin, ringed plover, sanderling, and (during the migration periods) other kinds of wader.

The sanderling and the turnstone, which I have dealt with elsewhere, are true winter visitors and so is the knot which comes in enormous numbers from Greenland and Siberia and feeds on the wet sand and mud while the tide is ebbing and flowing. During the winter months the knot's plumage is grey above and white marked with grey underneath, but in the spring, just before it leaves, the face and under parts become rich chestnut. It is a dumpy bird rather larger than the dunlin, but easily distinguished from the redshank by its short dark legs and comparatively short black beak.

Hard at work in the sea itself or resting on the shore, wherever possible on some rocky elevation or a post, you may descry cormorant or shag. In winter plumage these birds are much alike. The cormorant has a white patch on the thigh in summer and also a white throat, but after the autumn moult the thigh patch disappears and the new white feathers on the throat are tipped with brown. The shag is the smaller, but as in the case of the crows, size is not a reliable guide in the open air. Though he may venture a mile or two into an estuary, the shag is strictly a sea bird, and he has a preference for rocky parts of the coast. The cormorant is common on other parts, and is more enterprising. Frequently he pushes his explorations far up the rivers, and even journeys overland to fish in lakes many miles from the sea.

As you walk along the shore, flocks of wild duck with long outstretched necks and fast-flapping wings, may fly overhead or skim along the surface of the sea and give you many an opportunity of testing your skill in recognizing the various types in flight. You may see all sorts of duck there,

for the freshwater duck which feed on neighbouring lakes, often spend the day at sea to escape the unpleasant attentions of enemies. The widgeon, which is fairly common on inland waters, may be expected in large flocks wherever the sea grass *zostera marina* grows, and the best time to see it is just after the tide begins to ebb. The scaup seeks his living wherever there are mussel beds; the male has a black head, neck and breast and a silvery back. In deeper water you may look for the much larger scoter, the male of which is black, the velvet scoter which is also black but has a bold white patch on each wing, and the long-tailed duck, a small black and white duck with a long tail which it holds up at a jaunty angle. There also you may see one or another of the divers, most commonly the red-throated diver, which in winter has a white throat and a grey back spotted with white; less commonly the great northern diver, and rarely the black-throated diver.

Over a dozen different kinds of wild duck come as winter visitors to our ponds, reservoirs and estuaries, and as they are nearly all in their best wedding clothes they can be identified with the aid of a good book. The drakes have such beautiful and distinctive plumage that it is simple to pick them out from the others, make a mental note of their chief features and then compare these with the printed descriptions. But often you may see a party of ducks without an attendant drake, and then it is not so easy. In the case of the sawbills, many of the flocks that visit us consist of ducks only or of ducks and young drakes in immature plumage which is similar to that of the duck, the characteristic feature being a reddish brown head. When the handsome drakes do appear they are a sight for sore eyes.

Most species of duck have a coloured band on the wing

which is known as the speculum, and if this could be seen as clearly as it is shown in some pictures, duck watching would be very much simplified. The common wild duck or mallard, for example, has a broad band, or speculum, of a wonderful purple. The teal has a speculum of an equally wonderful green with a white or buff bar before it. But even at close quarters, on our city lakes where the ducks come to be fed by hand, the speculum is often not visible. When the wing is expanded the speculum forms a beautiful band across it. If a party of duck should take to flight with their backs towards you, you may have a good view of the wings as they rise, or you may get another chance when the birds are wheeling in the air if they should happen to expose their backs as they turn. It is easy to write this, but it is only fair to add that you will be very fortunate if you are ever able to identify a duck by its speculum. Ducks usually get up before you are near enough to distinguish their colours, and their wings move so rapidly that even when the birds careen towards you in the air the markings are invisible except in ideal conditions of light. Nevertheless, the chance of spotting the speculum adds zest to the hunt.

Experts have little difficulty in identifying duck on the wing. This they do by the general form of the birds, and by size and manner of flight. I have heard old gunners say that they could recognise any duck by the whistling of its wings; the wing being different in each species would naturally have a characteristic effect on the air which a keen ear would be able to detect. Another sign that helps is the form of the wing. The wing of the mallard and other surface-feeding ducks is comparatively long, narrow and pointed, and that of the diving ducks is short and rounded. When the eye is familiar with these differences

it can at once, on seeing a flock of flying duck, reduce the number of possible species by about half. Its small size distinguishes the teal from the mallard when both are in flight at the same time, and the clumsy bill is an obvious feature of the shoveller. With practice others can be identified by equally simple signs.

A further distinction between surface-feeding and diving ducks is worth noting. When they rise from the water, the former fly up at a sharp angle while the latter flap along the surface for a little before they shake themselves clear. No doubt this difference is due to the shape of the wings in the two types, but it is also associated with their manner of feeding. The ability to leave the water immediately and to rise almost perpendicularly is invaluable to the surface-feeders, for they may be nearly surrounded by tall reeds when they are approached by enemies and must overtop them if they are to make good their escape. The diving ducks feed in deep water and are not likely to be caught in such a trap.

More then half a dozen kinds of wild geese visit us in winter. There are four well-known grey geese, the greylag, the bean, the white-fronted and the pink-footed, and they are all very much alike. The first two may be recognized by the colours of the bill; the white-fronted by the fact that it has a conspicuous white patch on its face at the base of the beak; and of course the name of the fourth indicates that bird's distinctive feature. Obviously you must have a close view of the birds to see these details and wild geese are proverbially wary, but the ability to get near is one of the qualities of a good hunter, and it is the hunting that is the best part of bird watching. In addition there are two species of black geese, the brent and the barnacle. Besides being black these birds are smaller and slighter in

build than the grey geese. There is no difficulty in distinguishing them, for the barnacle goose has the face and throat white. This bird was given its curious name because before migration was understood, people believed that the geese which appeared so mysteriously in autumn and disappeared again in spring, were hatched every year from ship's barnacles.

Among our winter visitors there are two wild swans. These again may be known from each other and from the mute swan by their bills. The mute swan has an orange bill with a black tip and a black knob. The whooper swan and Bewick's swan have no knob, and their bills are black and yellow, with slight differences in the pattern. They come from Iceland and from northern Europe and Asia and are most often seen here in severe winters, but those observers who visit our reservoirs and lakes regularly have a good chance of seeing them in any year.

The haunts of the wild geese, however, are well known; the flocks return to the same quarters year after year and remain there throughout the winter. So bird lovers who are not fortunate enough to live in the favoured districts need have no difficulty in making the acquaintance of these birds. They are so regular in their habits that you cannot fail to see them if you spend a week-end at one of their recognized resorts.

I had so often read of the wonderful manner in which flocks of wild geese fly, and so often seen pictures of it, that for years it was one of my ambitions to visit some place which they are known to frequent, in order that I might be able to watch their movements with my own eyes. One spring day I had the good fortune to see seven of them passing northward above a busy street in perfect V formation, that is, one leading and the rest following closely

in two oblique lines, making an angle like a large V. I watched them with a thrill of pleasure, but in a few moments they were hidden by the roofs. This whetted my desire to see more of the birds, so at last one year I arranged to have part of my summer holidays in autumn, and went off at the end of October to spend a week at a certain part of the Norfolk coast where I had learnt that the geese came in large numbers to winter.

Night had fallen by the time I arrived, and, though the moon was almost full and the sky clear, I could do no more that day; so I went to bed early, intending to get up as soon as possible after daybreak and go out to explore before breakfast.

I was awake in good time and was lying thinking whether I should get up there and then or wait a little so as not to rouse the household too early, when I heard a great cackling. Could that be the geese or was it simply domestic geese in the poultry yard? I listened keenly. It was coming closer, and now it was passing overhead! I jumped up and rushed to the window just in time. There they were at last, about a hundred of them, flying low in the shape of a huge W and going seawards. I watched them till they were out of sight, and then I dressed quickly and went out to look for more. I did see another skein of them, about thirty, and they also were making for the sea. So as I returned to breakfast, I found myself wondering why they were moving in that direction so early in the morning.

It was several days before I solved this question, and before I did, I had something more to discover. I searched for them all day, but didn't catch sight of them again until sunset, when I saw two large flocks winging their way slowly inland about a mile farther east. On the two

following evenings I noticed that they made the same journey at the same time and by the same route. So, on the next day, I found a suitable watching place at that part of the coast and waited for them. I was not disappointed. Just as the sun was going down I heard a great cackling out at sea and observed a dark cloud rising from the neighbourhead of a sandbank that lay some miles off shore. Presently it took shape and came in shorewards on the same course as before, so I was able to study the movements of the birds as they flew towards me and passed overhead.

At first they seemed uncertain, for they stretched out into a long horizontal line, but presently one took the lead and the others quickly formed up behind him in two lines. As he was not quite at the centre of the flock, however, one leg of the V was very much longer than the other. In a few moments another leader pushed forward, and the V broke up into two long oblique lines moving forward parallel to each other. Still the flock was uncertain and made very slow progress, and gradually the two parties swung round into one horizontal line again. Then it took shape as a great W with two leaders, but these were not a success apparently, for each of them had his own ideas as to the direction they should take. So the figure soon melted and the flock for a little waved about like a flag, for all the world as if the birds were threaded on a string, until at last a leader arose near the centre and moved off to the right, carrying the whole skein with him in regulation form, except three or four that lagged behind. Presently one bird detached itself from the main body and swept back to these malcontents, not to join them but to urge them forward, and in this he succeeded, for when he reached them and took up a position behind them, they at once

increased their speed, and, when they overtook the flock, attached themselves to its shorter leg. Other skeins followed, some of them numbering two or three hundred birds, some thirty to fifty, and as they proceeded they went through similar evolutions.

As this happened every evening at the same time while I was there, and as I either saw or heard them flying seaward again every morning at daybreak, I concluded that it was their habit to go inland at night to sleep, but I wondered why they should do so when the weather was so fine. I discovered later, on another visit, that it was their custom to feed during the day on certain grass fields near the shore, and to sleep at night on a sandbank miles out at sea. This time I neither saw nor heard anything of them at sunrise or at sunset where I had observed them before, and I learnt that they visited the fields at the back of the town only in the autumn, and that they did so for the purpose of treating themselves to the barley stubble for which they have a particular liking. Further, that being wary birds, they ventured into these dangerous parts only at night, when experience had taught them they would be undisturbed, but only when it was nearly full moon, so that they might see what they were doing.

This wariness has given rise to the belief among sportsmen that geese place sentries when they are feeding. So far I have not found any evidence in support of this idea. Once by crawling on hands and knees across a wide field I was able to get within twenty yards of a large flock of wild geese, and I then stood up behind a gatepost and watched them for some time. I could see no individuals that were devoting their whole attention to the important duty of guarding the flock against surprise. But here and there in the flock one or another of the birds would stop feeding for

some moments, raise its head, stretch up its neck and look round and listen anxiously. So many of them did this that there was hardly a moment when at least one bird was not so engaged, and the flock was thus adequately guarded without the posting of special sentries.

Now, what appealed to me most in the wild geese and caused me to make those special journeys to see them, were their wonderful soldier-like movements and their method of flight, a method which, it should be remembered, was adopted from them during the Great War when squadrons of aeroplanes were formed. So I was astonished when I got back to London to find that the black-headed gull, one of our commonest all-the-year-round birds, regularly flies in companies arranged in the same way, and though I have been familiar with it from my earliest days, I had never before noticed that it had this habit. What surprised me still more was that I had never read of it in any book, and shortly afterwards I discovered that naturalists who were much more experienced than myself were unaware of it.

Every evening during the autumn and winter about sunset the black-headed gulls that feed on the Thames gather in flocks and fly westward to some sleeping place outside London, actually to the reservoirs at Barnes and Staines. When they have gone some distance they settle down to a steady flight, and if you are on, say, Chelsea Embankment, and watch them coming from the lower reaches of the river, you will notice that many parties are travelling in regulation goose fashion, that is, in V's with equal or unequal sides, or in oblique lines, that is, half V's, and that others are beginning to arrange themselves in a similar way.

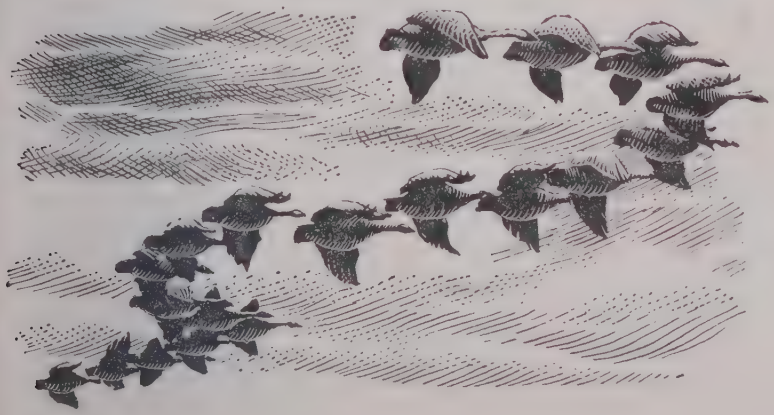
Another bird that travels in this manner is the lapwing. Ordinarily a flock of lapwings seems to be just a mob, but if you watch them closely, especially when they are engaged

in their aerial game, you will not fail to observe that there is something in their movements suggestive of the keeping in step of a regiment of soldiers. I have already described how the wild geese when undecided flap about in the air like a great flag; a similar effect is created by the evolutions of the lapwings and when the flock is large it is impressive. The birds have achieved something in the nature of discipline and the flock has therefore become organic; it is almost as if they were strung together at equal distances, for often they stretch out in single file or in narrow column, and when they do so the units maintain their relative position to each other, which means that they must fly consistently at the same speed and keep at a uniform distance from one another. Curlew, golden plover, oyster catcher always tend to travel in streamers, and I should never be surprised to see them actually in V formation. I have observed small parties of curlew flying with their wings moving in such perfect time that to all intents and purposes each group might have been one bird. But towards the end of December, 1927, I watched a great winter migration of lapwings, a phenomenon that happens when the weather either is, or is going to be, severe. The flocks were passing overhead all day and were travelling westward. The first group I noticed consisted of five birds and formed a perfect V. They were flying at a comparatively low level. The larger flocks had mounted higher, some of them were little more than specks in the sky, but they were all more or less grouped in the same manner.

That was on the 18th. On the 20th large flocks of lapwings arrived in Newfoundland. As the lapwing is not a bird of the New World, they must have flown across the Atlantic. It is tempting to think that they were among those I saw travelling westward two days earlier. But one

of the birds was identified by a ring that had been placed on its leg in the north of England, so the probability is that they were part of a vast movement of lapwings and other birds which took place throughout the British Isles owing to the bitterness of the weather at that time.

Such winter movements are a demonstration of the first step in the development of migration as a habit. These stay-at-home birds which are hardy enough to live through the average British winter, flee before the menace of exceptionally severe weather. In this instance some had the misfortune to be blown across the Atlantic, but the majority of the fugitives found sanctuary in Cornwall, Ireland and southern Europe. Thus we see the inception of the two great tides of migration which are characteristic of the British Isles, the east to west and the north to south. The birds which make these enforced winter journeys return eastward and northward in spring. In time ringing will prove whether their memory of the route they followed is as good as that of the regular migrants which come back year by year to their native districts.



CHAPTER FIFTEEN

WINTER SONG

I AWAKE every morning to the song of a robin, and I could not wish for a more delightful greeting. I shall never agree with those scientists who declare that the robin's song is simply a challenge to all other robins within earshot to come on if they dare. Of course, I know that in August and September there is no more pugnacious bird than the redbreast, and sometimes his battles are to the death. But this fighting is a matter of economics and in my experience has never been associated with the song at its best. While it is in progress there is a good deal of singing but it is very imperfect and is chiefly the practising of the young. My attention was first drawn to this one August when I had to be in the open every day. I had hitherto thought that, like most other birds, the robin

was silent in August, but then I heard him singing every day, and at all times of the day during that month. He even sang while he was moulting, a very unusual thing among birds. While I was watching and listening to make sure of this, I noticed two other things. First, the song was short and very imperfect, and secondly, the birds that were singing it were young cocks with the red just beginning to show on their breasts. So those August pipings were the first attempts of that year's birds to repeat the immemorial song of the species. Everyone has laughed at the ridiculous crowing of the farmyard cockerels, and noticed the ludicrous pride and persistency with which it is repeated till the whole neighbourhood is irritated by it. But very few have reflected that this trying and gradual improving of the call is not altogether a matter of instinct. The cockerels have a natural impulse to shout a challenge to their rivals, but they have to learn the rest, and the young of redbreasts and other birds have to perfect their songs in a similar way. The young robins practise theirs in all their spare moments during August and September. As soon as moulting is over, perhaps sooner, their elders begin to sing again, and then they are able to make better progress by the study and emulation of masters. Their practising is often interrupted by attempted invasions, but when the question of territorial rights has been settled, which happens before the end of September, the singing goes on. It has now reached perfection, and throughout the autumn and winter there will be little or no fighting, but on dull, wet or fine days, in all but the very hardest weather, you may hear the robin's beautiful song, one of the most varied in nature and often enriched with phrases of distinct originality. Besides, I have watched and listened to a robin singing to himself in undertones. The song was so soft

that it could not have been heard by his nearest rival, which was singing at his full power some forty or fifty yards away. It was a very remarkable song, too, that he sang. As a rule a robin pours forth his music in separate, trilling phrases with a pause after each, but this bird sang continuously without a break for several minutes, and I knew by his expression and by his demeanour and by the effect of his sweet phrases on myself, that he felt every note deep down in his heart.

Indeed, it is only necessary to observe any bird when it sings, thrush, blackbird, chaffinch, even the starling—to realize that its song is as much a formal rendering of emotion as any of our own. The only difference between the two is in the form.

Neither is bird song, as some scientists believe, merely a matter of sex, for it is sung all the year round, not only in the breeding season. It certainly has much to do with matchmaking in the spring, but so have men's accomplishments though they are not practised with that end in view. But as cock and hen robins live apart during the winter, it cannot be intended then to soften the heart of an obdurate lady love, unless indeed the robin suffers from the same kind of miserable delusion as is said to torture the nightingale from April to June. The discovery of this awful punishment of an apparently inoffensive bird has been made by certain naturalists, who have explained to their own satisfaction why the nightingale sings all through a beautiful June night. It is not because he feels the charm of the night, nor because he prefers to sing at that time, nor even because he likes singing, but because he had to attract a mate in the middle of a particular night in the early part of last April. The male nightingale arrives several days before the female, and at once makes

his way to the thicket which is to be his haunt for the rest of the summer, and which may be ten or twenty miles from the home of his nearest neighbour. Here he sings his heart out every night, until, a flock of hens happening to pass overhead, his own mate hears his voice and flies to his arms, or if he is a young bird, one of the party is overpowered and descends, or more probably the whole band fling themselves at his head and make his life a burden till he chooses one of them, then the remainder pass on to the next occupied territory twenty miles away. Thereafter the poor fellow, having been wound up at the beginning of April for this particular purpose, has to go on singing every night till he has wound himself down, in a frenzied and tragic endeavour to attract unwanted mates from the empty upper darkness. No wonder the poets have been captivated by him!

This is not the place to discuss whether the hen nightingale may be expected to have as good a memory for her old nesting site as her moonstruck mate. I have given the theory as it would work out, and may it prove an effective and lasting warning to all who are tempted to apply watchmaking mechanics to nature. It would be awful to think that the pleasing melancholy of the robin's song, which is so seasonable in autumn and never unseasonable at any other time of the year, is only a cruel madness inflicted on him for the benefit of the species on a critical day in February, but from which he can find no relief; for even in the heart of winter he must go on eternally wooing his wandering mate, with the certainty that if she dares to come, he will fiercely despatch her about her business in double quick time. No, there is something deeper than that in the songs of autumn and winter.

When I first made the acquaintance of a flock of red-

wings I studied them regularly throughout that winter. They rested every night in a certain wood, and during the day they fed greedily on the haws that reddened the hedges of the surrounding fields and the bushes of a neighbouring common. The gathering call of these birds is *tyupp*, and this they repeat frequently while they are feeding, while they are fluttering from point to point on a hedge or while they are flying in flocks across country, and they also use it as an alarm. They have another common note which sounds like a long-drawn *eeece*. This may be used separately as a call note, but the flocks are fond of repeating it in chorus. When they have made a good meal, several of them will fly up into a tree, and there, with all the signs of blissful enjoyment, they will sit for a long time singing it together, and in the evening they sing it again at the roosting place before settling down to sleep.

Those musical parties of the redwings were a discovery. They gave me an answer to the assertion that a bird's winter song is only a challenge, for these birds were not rivals. They were companions in adventure and had had good fortune, for they had fed well, and therefore they were happy and, like ourselves in similar circumstances, were singing together because of the joy in their hearts. But I had still to make a greater discovery about redwings. One wonderful winter morning, when the whole country was covered with a thick hoar frost and a pink sun was rising through a blue-grey haze, I visited a favourite feeding place of a large company of redwings, a double row of thorn bushes which were heavily laden with haws. The birds were there as I had expected. They were not feeding, however, but to my astonishment and infinite delight the whole flock was in full song, and the air was rippling with a gentle flood of beautiful music. This chorus was not a

multitudinous repetition of a single note such as I had heard before. Each bird was uttering a series of warbling phrases, which suggested to me at once a whisper song of the missel thrush. It was subdued, and it may not therefore have been the real full song of the redwing, but the whole effect reminded me of some perfect spring mornings when I had been awake at sunrise and had lain in bed listening to the great outburst of joyful sound from a large wood quarter of a mile away. Here was a trophy indeed, first because, to judge by the records of other observers, very few have ever had the privilege of hearing the redwing singing in this country, and secondly, because it was a fuller proof of my belief. It was just the kind of day that makes us glad to be alive, for the frost and the sun set our pulses tingling, bring roses into our cheeks and a bright sparkle into our eyes, and set us running and laughing for joy, and those redwings evidently felt the thrill of it too and were responding to it in their own way.

An hour or two later on the same morning I had a similar stroke of fortune; I heard a song that was quite new to me. There was still frost in the air, but the warmth of the sun had made gloves uncomfortable, and had melted the hoar everywhere except in the shade. I had wandered some distance through a neighbouring forest and had just come to a clearing when the strange notes caught my ear. I could see the bird sitting on the top of a tall ash, and when I examined him through my field-glasses I was thrilled to discover that he was a goldfinch. It was the first time that I had heard this bird sing, but subsequent records have proved to me that what I heard was the full song. It was late in November.

In similar but keener weather, during a Christmas holiday on the Norfolk coast, I heard a greenfinch twice in one

day singing his full spring song. The first time, which was in the morning, he was sitting on the top of a thorn bush and flew away as I approached, but the second time, which was about sunset, his perch was a telegraph wire. This may have been the same bird, but as there were great flocks of finches on the fields and hedges near by, I have no proof that he was. He twittered for a little where he sat, but presently he left the wire and fluttered round repeatedly in a wide circle singing jubilantly the while. On this occasion he had a companion. She sat stolidly on the wire, however, treating him with the utmost indifference but no doubt wondering what madness would seize him next, and presently she interrupted his performance abruptly by flying off to rejoin the flock. That is the only instance in my experience of a love display being made at that season and in such circumstances. The spirit of the day had apparently got into his blood, and though the temperature was falling quickly towards a bitter night, he had had to let himself go, so he had slyly separated an attractive female from her companions and added to the delirium of his transports a little irregular flirtation. And this happened in a hard period of one of the longest and severest winters on record, that of 1916-17. As a rule the greenfinch is among the latest of our resident birds to begin singing in spring.

Earlier that same afternoon, I watched a company of seven linnets sitting on a tree facing each other for about half an hour and singing blissfully together, not their full spring song, but those three sweet, mournful notes with which the males are fond of regaling each other when they meet on the gorse during and after the nesting season.

Wrens and hedge sparrows sing throughout the winter though not so frequently nor so constantly as the robin, and after the August silence, I have heard skylarks, chiff-

chaffs, willow warblers, goldcrests and tits singing, and I cannot believe that they were engaged either in attempting to pair or in threatening up to the last those members of their own species which in a few days they would accept as boon companions for the winter.

One of the delights of winter bird watching on the mudflats, too, is the song of the curlew, which is sung occasionally in charming snatches either while the bird is feeding or while it is floating low down on steady wings from the spot where it has been feeding or resting to another only a few yards away. There is no question here either of territorial rights or of sex rivalry.

Other attempts have been made by scientists to explain the singing of birds on cold biological lines. Some have believed that it is only a kind of safety valve through which the bird can blow off steam when he is feeling so wildly excited that he does not know what else to do with himself, and, when faced with the problem of winter song, they have concluded that it is merely a kind of play like the fooling of a dog, that the birds happen to be specially well and, being unable to contain themselves, they make a noise about it as children shout when they come out of school.

All this strikes me as if these great men had first built a theory and then tried to cram Nature into it. Those ideas are equally applicable to our own singing. We make love by singing, we work off our superfluous animal spirits by singing, we sing when we are well and happy, and we sing for rivalry. But we should never sing at all unless we liked singing, and neither would a bird. We sing because the sounds we make are pleasing to our ears, and having discovered this wonderful and delightful thing, and developed it because we loved it, we afterwards found that we could utilise it in various ways. We did not begin by imagining

that if we could make beautiful sounds with our mouths and arrange them in a beautiful series we should be able to spoil our rival's chances; we first made the sounds and, being well pleased with them ourselves, we tried them on the girl. Why, then, should we laboriously endeavour to prove that a bird's love song has been evolved in a different way? It has been demonstrated beyond doubt that birds have the same five senses as we have ourselves; that they see, feel, taste, smell and hear with the same organs as we do, and that their consciousness is seated in a brain and nervous system similar to our own and derived from the same source. It has also been proved up to the hilt that birds make noises with the breath of their lungs as we do. Surely, then, when those sounds are sweet and appeal to our superior judgment as beautiful, nay, are listened for and loved by us as one of the priceless gifts of life, surely it is reasonable to conclude that the birds themselves hear their own songs and at least like them a little.

But what all the scientists have failed to observe, or having observed, have overlooked, is the obvious but startling fact that birds have given definite forms to their songs. That very word "song" ought to have given them the hint, but perhaps it misled them; it was popular and sentimental and therefore unscientific. There is no form in the cawing of the rooks, and, though the sounds of a rookery in spring have a wondrous charm, that cannot be attributed to the birds but is akin rather to the music of water and wind. But there is form in the call of the carrion crow, which consists of three notes *karrr-karrr-karrr*, in the hoot of the tawny owl *hoo-oooo*, *hoo-oo-oo-oo-oo-oo-oooo*, in the long, loud rattle of the red grouse with its final *go-back*, *go-back*, *go-back*, in the spring shouting of the lapwings, *tcherr-weet*, *tcherrr-willooch-willooch-weeet*, indeed in every call or song

in which two or more notes are put together to make a recognisable whole. These, however, are primitive types, more or less repeated, extended, or many-syllabled words. Others more highly developed are quite common. The songs of the chaffinch and the yellowhammer, to take two simple and familiar examples, have each a beginning, a climax and an end. That is to say, they have not only form but artistic form, and they leave on the mind of the listener a pleasing impression of completeness, balance and perfection, such as we receive from the reading of a sonnet or the playing of an old-time melody. In short they are little works of art, tiny cameos of song. The proof of this is that they satisfy and never pall however often they may be repeated. And they are none the less art because they are not the work of individuals, but of many generations. The race has composed the song and the individual interprets it. But there is considerable variety in the interpretation. Indeed, in still more elaborate types of song, that of the blackcap, for instance, the performer is able to remember the phrases of other birds in no way related to him, and to weave snatches from them into his own.

Wide differences of temperament, too, are expressed in the songs of the various species, but these are overlooked by the makers and upholders of the conventional theory. The scientists realise that if their theories are to be accepted they must be universal, and they have stated them as universal. But an elementary knowledge of bird song proves that they are not. It is reasonable to explain the songs of chaffinch, skylark and thrush as an overflow of nervous excitement or of animal spirits, but when we compare these with the songs of yellowhammer and robin the theory breaks down. The chaffinch's is a quick, merry ditty with a rollicking swing in it and full of jollity and the joy

of living; the yellowhammer's is slow, quiet, dignified and plaintive. Now, the scientists very rightly point out that in studying the lower animals it is wrong to argue by analogy from human qualities or experience. Because, for example, a melody sung or played in a minor key expresses or induces in us an agreeable melancholy, it does not follow that a bird whose song has such an effect on ourselves is influenced by similar feelings to our own. And if we had only the songs themselves by which to judge, I admit that the evidence would not be sufficient to justify my belief. But we have a great deal more. It is possible to argue, in order to bolster up a theory, that though the yellowhammer sings a plaintive song, he is none the less bubbling over with the same superabundant vitality as the chaffinch, but it is only necessary to compare the two birds while they are performing to realise that this is a fallacy. If at a concert we were to stop up our ears with cotton-wool or wax so that no sound could penetrate to them, we could guess with the greatest ease, by simply watching the artistes, whether their songs were jolly or sad. Human expression is infinitely more plastic than that of a bird, but it is no straining of the imagination to say that in his attitude, in the poise of his head and in the glint of his eye, the farmyard cock standing on a fence and crowing at full stretch his message to the world, so vividly recalls the rotund tenor at Covent Garden in his most fervent moments, that it is impossible to escape the conclusion that there is something fundamentally the same in the two. They are both artistes and they have one and the same object, to create the greatest possible effect by a skilful performance of a well-known musical composition. That they are at opposite ends of the ladder goes without saying, but the chief difference between them lies in the fact that the tenor may change his tune as

often as he pleases, whereas the cock is limited to one. The cock may be doleful and often is, but at such times he refrains from singing, whereas the tenor may be miserable yet sing a merry song or vice versa. Like the cock, the chaffinch and the yellowhammer are limited, each in his own way, to a single song and mood, and a comparison between them is all the more interesting because, as I have already suggested, their melodies are variations of the same theme, one in the major and the other in the minor. The chaffinch throws himself into his and pours it forth with the utmost vigour and brilliance. Every atom of his little frame vibrates with the joy in it, and he tosses his head and turns it sharply from side to side as he works up his frenzy, his eyes flashing brightly the while, till he flings the whole force of his being into his gladsome climax. In the mood of the yellowhammer the theme becomes plaintive and ends with a sigh. There is no fire, nor energy nor excitement in it, and the whole bearing of the bird is strictly in keeping with this. He sits calmly on the top of his thorn bush, with his eyes turned pensively heavenward and his head a little to one side, with all the air of a human artiste singing a sad or dreamy song. It is just the same with the robin. Close your ears and watch him as he sings and you will see that he is not riotously cheerful, as you would expect him to be if he were overflowing with either nervous or vital energy, but is sentimentally melancholy.

In considering this specialisation among birds, it is well to bear in mind that we have similar limitations ourselves. Those of us who excel in serious music seldom succeed in other veins, while those who have a natural aptitude for light, florid or humorous songs are wise to avoid the sad or tragic.

Birds go still further than this. It is recognised that the males compete with each other in song, and it has been

suggested that this is merely an attempt to shout each other down. I have already shown that there is no such thing as selection of the males by the females, the matter being settled by the males themselves with beak and claw wherever there is any possibility of choice. The hen marries the stronger of the two, and, however bad his singing may be, she no doubt admires it as blindly as her human prototype does the crude and throaty bawling of her husband. The female bird, therefore, has had about as much influence on the development of the male's vocal powers as woman has had on the evolution of cricket. The singing of the males, however, long outlasts the period of courtship, and is usually more brilliant after than before it. They are no longer troubled with the distraction of duelling and can devote themselves freely and whole-heartedly to their art. This they do in the first place because they love it just as does a born musician among ourselves, but the accomplishment of their neighbours stirs within them the spirit of rivalry which spurs them on to greater effort, and thereby strengthens and magnifies their natural gifts. It is this intense training of their powers to the highest pitch of perfection, not careful selection by the hens nor the weeding out of the less skilful, which has in the course of ages evolved the songs to the state in which we know them. That it has not resulted in wild raucous screeching, which we should have expected if it had been merely a competition in shouting down, but instead has produced a wonderful variety of beautiful, well-balanced phrases, is proof that it has been tempered by judgment, which, if only the less skilful could make themselves understood, might give rise to a new school of musical criticism.

But even that is not all. Birds are able to make other than vocal noises, and they have even gone so far as to

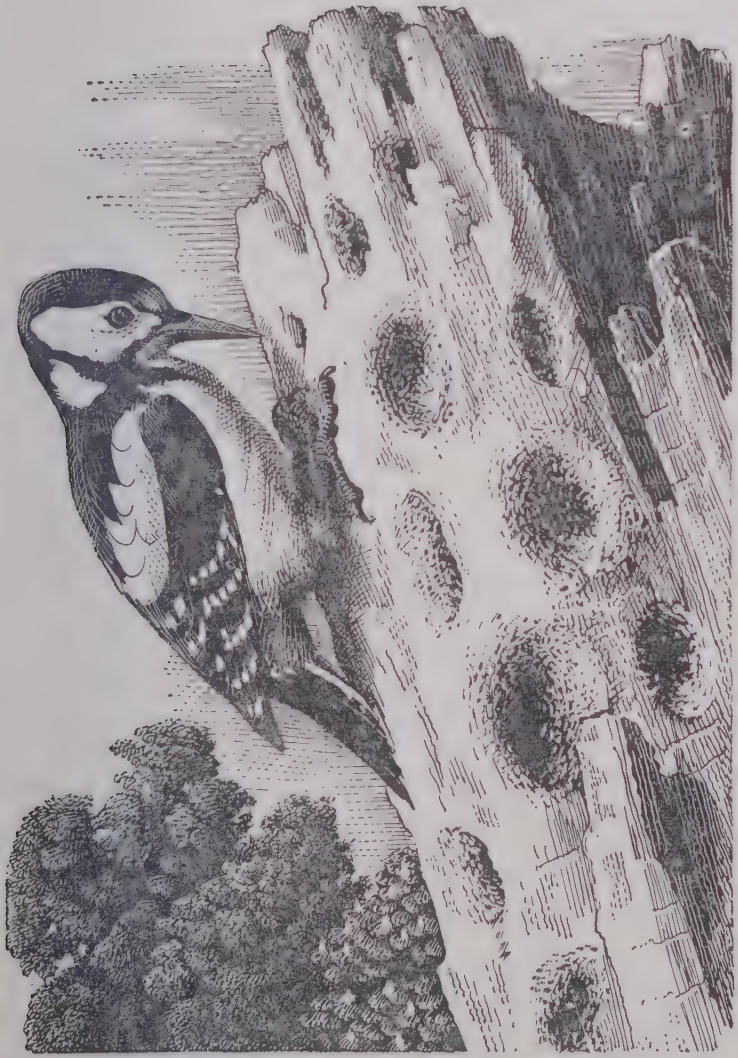
invent musical instruments. A nigger minstrel, who can snap his fingers or clap his hands rhythmically, is admitted to a humble place in the great company of musicians. Most birds make sounds with their wings. Among small species it is hardly a sigh, but when they pass in a flock, it is as if a soft breeze were rustling through a field of corn. The wings of duck and geese whistle at every stroke as they fly, and pigeon and pheasant clap their wings over their backs every time they spring into the air. I am inclined to think that the pigeon employs this clapping in his love display, but I know the nightjar does, and I am positive that the resonant wing-beats of the lapwing are an essential part of his. There can be no doubt, however, about the bleating of the snipe. This sound is produced intentionally by the vibration of the two outermost feathers of the tail, while the bird is circling overhead, and it has a more or less definite form. It consists of one note repeated several times, like many of the vocal calls of birds. Nevertheless, as tail feathers are part of the bird itself, this performance is treated by scientists as one of those remarkable variations that have been preserved and developed by a process of selection. The bleating of the snipe is commonly spoken of as "drumming." If it were truly a form of drumming the conventional theory could not so easily be applied to it.

The drum has an honoured position in all bands, and especially in the greatest of them, the modern orchestra. In some primitive societies it is the chief or only musical instrument, and is beaten with the palms of the hands. There is a wide difference between a human hand and a bird's beak, but both serve the same purpose, so essentially there is no difference between a blow from a beak and a blow from a hand.

Woodpeckers use their beaks for feeding and digging,

but in addition they have a habit of sitting on a branch and tapping it vigorously, as I have described elsewhere, in such a manner as to create a resonant note which can be heard quarter of a mile away. This is not done for the purpose of startling insects from their retreats. Woodpeckers can find plenty of food without resorting to such sensational methods.

The conventional explanation of it is that once upon a time a plain unsophisticated pecker of wood hatched a son who had a peculiar affection of the neck, which in moments of excitement caused him to give a quick, forcible double tap to the branch on which he was sitting. This astonishing failing or gift electrified the woodpecker world and gave its owner such an advantage over his rivals that he was able to found a new race, which gradually deprived the old race of sustenance and so drove it out of existence. In due course another bird was hatched that for some inexplicable reason gave three taps instead of two, and he also triumphed so that in turn the double-tappers were abolished. And so it went on slowly for ages till now all woodpeckers do twenty taps a second. But to-morrow, or next year, or perhaps next century even they will have to give place to yet another variety that will do twenty-one. Thus by a succession of "minute variations" has evolution produced this extraordinary phenomenon, and of course from the beginning until now not a single bird has ever known, and from now until the end of time none will ever know, what he has been doing or why he has been doing it. Indeed, if they could now be made to think or understand, they would be astounded to find that in all the most emotional moments of their lives they had invariably been sitting on the particular piece of wood that makes the loudest and most resonant noise when it is tapped. But such are the wonders of instinct.



Greater Spotted Woodpecker.

Unfortunately for this theory the woodpecker does know what he is doing. When he is not satisfied with the tone of his drum he tries another branch and yet another till he finds one that pleases his ear, and if he is an old bird, he will fly to particular trees which he knows from experience are the best drums of the neighbourhood. He has no need to drum, for like other birds he has a voice with which he can make himself heard. He performs during the period of courtship, which proves that he considers it an accomplishment, but after that is over he continues to drum as other birds continue to sing, and he has been heard to drum at all seasons. His drumming indeed is a substitute for a song, and his drum is a musical instrument of percussion which, in a more highly developed state, is known as the xylophone. In short, he has discovered that wood has the property of emitting sound when it is tapped, and that some pieces are more resonant than others, and he has invented a means by which he is able to sustain the note. The same means is employed by performers on kettledrums and dulcimers.

The truth is that birds have developed certain artistic qualities. We know that they are as fond of colour for their own adornment as any woman; they have a sense of form, otherwise they could never build such wonderful nests; and many give expression to their exuberant spirits or their simple feelings of happiness by means of vocal music. It may not be music in the Royal Academy sense, because it cannot be written down in black blobs within measured bars, nor reproduced on the piano, but it is none the less music. It does not conform to the arbitrary human scale, but it may be defined as a beautiful succession of beautiful sounds inspired and influenced by emotion, and there is not much more that can be said for the finest works of the great masters, except that they are more elaborate.

CHAPTER SIXTEEN

DISTRIBUTION

As the sparrow is our commonest species, it would seem natural that we should all begin our interest in bird life by watching him and learning something of his ways. For myself, I must admit that the sparrow might almost be described as an acquired taste. Though sparrows nested in numbers under the eaves of my home, I did not take any definite interest in them until I had a considerable knowledge of the birds of the countryside. My earliest recollection, however, of active observation of a bird dates from before I was three. I was attracted by a starling which was singing on a chimney-pot, his black and purple plumage and yellow bill resplendent in the bright sunshine of a genial spring morning. My next is of listening some years later, as I have described elsewhere, to the beautiful song of

the curlew and trying but failing to see the bird. That was on the moors many miles from home. But speaking generally we do become acquainted first with the birds that frequent our own or our neighbours' gardens. We notice the blackbird or the thrush feeding on the lawn, the robin, the hedge sparrow and perhaps the chaffinch at the bird table, two or three species of tit at the suet or cocoa-nut hung up to attract them, the house martin, the swallow and the swift flying to and fro overhead. In the lanes and fields we see some of these birds again and several others, among them the marsh tit, the long-tailed tit, the wren, the yellowhammer, the greenfinch, the missel thrush, the rook, the jackdaw, the lapwing, the skylark, and the kestrel. When we reach the woods we find a number of species peculiar to that type of land, such as woodpecker, nuthatch, tree-creeper, goldcrest, jay, magpie and pigeon. Where there are streams or ponds we may expect to meet with others. The kingfisher and the dipper are birds of the streams, and the moorhen, the coot, the grebe and the duck haunt pond and lake. By visiting marshes, estuaries and the seashore, or commons, heaths and moors we can extend still further our knowledge of bird life, for each type of country has species which are adapted to live in it. Such visits may perhaps be made in the course of an afternoon's walk, or in a whole day trip or a week-end, or they may imply longer journeys which we can accomplish only at holiday times. We cannot, for instance, expect to see the red grouse unless we go to the heather-clad moors or to mountainous districts where certain other moorland plants grow freely and thus provide a plentiful supply of suitable food. The red grouse is a denizen of the open moor and hillside, the black grouse prefers districts where pine woods adjoin the moors, the capercailzie is chiefly an inhabitant

of pine woods, and the ptarmigan may be found only on the highest mountains near the snow level. If you live in country where clear streams tumble over rocky beds from the mountains to the sea, you may count the dipper among your everyday acquaintances, but you may have to travel far to see the kingfisher which prefers the sluggish streams, ditches and lakes of the lowlands. Each in his own sphere, these birds are distributed over wide areas. A number of others are much more restricted in range and have to be sought in special localities.

I have already instanced the ptarmigan, and have described how I visited Norfolk to see the wild geese. The geese are constant to their chosen winter quarters; the same species returns regularly every year to the neighbourhood which it has frequented for ages past. One curious feature of their distribution is that certain kinds not only favour particular localities, but also particular coasts. The pink-footed goose and the brent goose are most common on the east coast, the grey-lag goose and the white-fronted goose on the west, and the barnacle goose on the west coast of Scotland. In some localities on the west coast, however, the pink-footed goose is plentiful, and I have seen the white-fronted goose in Kent and in Norfolk. Formerly the grey-lag goose nested in suitable parts of England, but now if you wish to see it in summer you must visit the north of Scotland or the Hebrides.

In other families we find similar limitations of particular species. The rooks live in flocks and favour the neighbourhood of human habitations, but the crow is solitary and nests on more or less isolated trees at a safe distance from houses. Formerly the raven nested generally throughout the country and made its home in tree tops, but now it breeds for the most part on the inaccessible

ledges of sea cliffs or inland precipices. The handsome chough, or Cornish chough as it used to be called because it was better known in that country than in other parts of the country, is a rare member of the same family which may be found here and there on the sea cliffs along the west coast from Cornwall to the Hebrides, and also in some inland localities in Wales.

Song thrush, blackbird and missel thrush are common in most parts of the country and are to be seen at all seasons, but their cousin the ring ouzel is a summer visitor and, except when it is passing to and from its special haunts, it may be found only on the moorlands. In such localities it is common in Scotland and in the mountainous parts of northern England and in Wales, but it also nests in Devonshire.

The yellowhammer is a familiar bird of our roadsides and wastes and attracts attention both by his conspicuous yellow plumage and his wistful song. His cousin the reed bunting is common in marshy ground or on the banks of ponds or lakes. The corn bunting is not by any means to be seen in every cornfield. Near the coast he is common in cultivated and waste ground alike, but inland he is plentiful in certain limited areas and rare in many districts. The cirl bunting which more nearly resembles the yellowhammer than the rest of the family, is still more restricted in its range. It is most common in the southern counties of England, but is also found in some parts of Wales. The snow bunting, which is a visitor to our coasts in winter, may be found nesting here and there near the snow level on some Scottish mountains.

In the other branch of the finch family, we are all familiar with the house sparrow but very few people seem to know the tree sparrow. This no doubt is largely because

the house sparrow is so commonplace that we are liable to treat all sparrows with indifference. If we make a habit of scanning with care the flocks of birds that feed in farmyards throughout the winter, we may often find one or more tree sparrows with the rest, and whenever sparrows are seen among trees at a distance from buildings there is a likelihood that at least some of them will be tree sparrows. Both sexes of tree sparrow are alike and they closely resemble the cock house sparrow. The distinguishing marks are three in number. The crown is chestnut (in the house sparrow it is dark grey), the cheek is white with a large black patch on it (the house sparrow's cheek is greyish and is not patched), and there are two white bars on the wing (the house sparrow has only one). In some localities the tree sparrow is common and in others scarce or rare. On the whole it is more plentiful in eastern counties than in the west. I have found it nesting in holes in the thatch or under the tiles of farm buildings, and also in small woods of oldish trees in which there were many holes produced by decay or by the work of woodpeckers. Even the house sparrow is not universally common; there are districts in Ireland where it is scarce.

The linnet is generally distributed throughout the country and is to be found wherever there is waste ground with gorse, bramble or other rough vegetation in which it can nest, except in the west of Scotland where, curiously enough, it is scarce in many parts. The twite, a similar bird somewhat smaller and with red on the rump instead of on the head and breast, may sometimes be seen in the south of England in winter, but in summer it must be sought on the moorlands in the northern counties. It is more plentiful in Scotland, especially in the west and on the islands. The redpoll, another similar bird still smaller

and with a conspicuous patch of red on the crown, is well distributed throughout the country, but is more common in Scotland than in England. Even in Scotland it is rare in the north-west, and in England it is local, nesting in some numbers in certain districts and not at all in others. The siskin, which may be seen in flocks during the winter in the south of England, especially where there are alders, is in summer almost exclusively a bird of the Highlands where it nests in fir and pine woods. Another species which is confined to the coniferous woods of the Highlands is the Scottish crossbill, a somewhat larger bird than the common crossbill, and entirely limited to Great Britain.

It is not possible without committing myself to much wearisome detail to give an absolutely accurate account of the distribution of any species. My aim is to draw attention to this aspect of the subject which is inadequately treated in most bird books. Some of the phenomena are very remarkable, for instance, the fact that broadly speaking the shag is more or less confined to rocky parts of the coast and the cormorant to sandy, shingly or muddy parts.

The pied wagtail is common everywhere in this country and may be seen actively working on roads, in gardens and fields and on roofs as well as by margins of stream or lake. His continental cousin, the white wagtail, occasionally nests in this country, and the two species sometimes interbreed, but it is a regular passage migrant in spring and autumn. A few may be seen on the east coast, but considerable numbers travel by the west coast, This seems to indicate that they are passing to and from Greenland and Iceland. The differences between the two are slight but distinct. The pied is black above from crown to tail, and this black joins, on the shoulders, the black of the bib. The

white has black on the crown and the back of the head and also has the black bib, but its back and shoulders are pearl grey.

Like the pied wagtail, the grey wagtail is a resident species but it is strictly a bird of the waterside. It has a decided preference for fast running streams and an engaging taste for the vicinity of a waterfall. By its beauty, grandeur and music a waterfall exerts a powerful influence over the human mind, but I have always found that its attractions are greatly enhanced by the presence of this graceful, brightly coloured sylph. In winter I have often seen this bird on the banks of lowland lakes and rivers, and in recent years a number of pairs have taken up their summer quarters on such streams, but always, in my experience, where the sluggish waters are broken by waterfalls. I know one stream in Sussex where two artificial waterfalls with only about five hundred yards between them, are occupied every spring each by its own pair of grey wagtails. The yellow wagtail is not attracted to running water. It is a bird of the open meadows and waste lands and the banks of lake and reservoir. Even so it is not generally distributed throughout the country. In eastern counties it is common in some districts and absent from others, but in the west of England and also in Scotland and Ireland it is rare.

That wonderful songster, the woodlark, which is one of our rarer birds, has for long been inexplicably confined to certain scattered localities in the southern half of England though hundreds of equally suitable nesting grounds have been open to it in the intervening country. In recent years it has been increasing in numbers and spreading and has even invaded one of London's outlying parks. One suggestion that has been offered to explain this change is

that it may be due to the ravages made in so many of our woodlands during the war. This may be so. The woodlark likes open ground in which well grown trees abound, and the cutting down of so many acres of woodland may have created fresh opportunities for its expansion. But the "new" localities in which I have myself seen and heard it are old in their present character and ought to have been occupied by the woodlark for many generations.

Considering the enormous numbers of insects that pester us in summer, it is surprising that our two species of flycatcher are not more plentiful. We cannot say that their balance has been struck by the limits of their food supply. There is room in the country for as many flycatchers as there are robins at present, yet there is no sign that our flycatchers are increasing in numbers.

Another of the good old theories is flatly contradicted by the spotted flycatcher. This bird is so modest in colour that it is overlooked by the majority of people, and its song is so slight and so low that it cannot be heard more than a few paces away. Nevertheless, it spends the summer here in isolated pairs and each male has a mate. So widely are their territories separated that, if the female had to find the male by looking for his plumage or listening for his song, she might easily search in vain all through the season. But apparently she discovers him without difficulty.

There seems to be no economic or utilitarian reason why the spotted flycatcher should distribute itself in this fashion. All the pairs that visit us could spend the summer in riotous plenty in the southern counties of England if they wished. They are not forced to spread northwards either by the need of finding fresh food supplies or by the pugnacity of those of their own species which occupy the

the more southerly territories. An enormous number of excellent territories are left untenanted in the south, while the pairs that might take possession of them push on northwards and scatter themselves at wide intervals over the whole country.

Yet we are told to believe that the tree pipit, which is also well distributed throughout the country during the summer in similarly isolated pairs, has been forced by internecine competition to adopt this unsocial habit and has evolved its beautiful song and dance to demonstrate to its distant neighbours, to whom it is both invisible and inaudable, that it is sovereign over its chosen territory. This misleading argument is due to the fact that natural history is dominated by the laboratory scientists who have blindly accepted a theory and are therefore bound to interpret everything in terms of that theory, whatever the truth may be, just as our forefathers, in their ignorance, had to interpret everything in terms of Providence.

There is no evidence that the pied flycatcher has any more need of a conspicuous plumage or a beautiful song than has the spotted flycatcher, but he has both. What is more disconcerting to the field naturalist who goes out, armed with the fashionable theory, to read and understand the phenomena which he observes with his own eyes and ears, is the fact that in spite of these "advantages" the pied flycatcher is not nearly so "successful" as his inconspicuous cousin. He is restricted to a very small portion of the country and, as a regular nesting species, is known almost exclusively in the west. There is room for tens of thousands of pied flycatchers up and down the country in the territories between those occupied by spotted flycatchers, but year after year those desirable estates remain unclaimed while the birds invariably return to certain happy valleys

in the west. A few pairs nest annually in Devon and Dumfries and odd pairs have been reported in many other counties from the south of England to Inverness-shire. There is no evidence to favour the theory that those pioneers have been driven from the land of their fathers by economic pressure, that is, by overcrowding of those happy valleys in which the species has nested from time immemorial. The birds are not trying to spread southward, eastward or northward. On the contrary their numbers are not increasing, and those pairs that are found breeding exceptionally in other counties appear sporadically and unaccountably. The food of the two species is essentially the same, so on the face of it there seems to be no reason why one should be distributed generally throughout the country and the other confined to a limited area. Is it possible that the pied flycatcher has a preference for some kind of insect which is to be found only in the districts which it favours? Or can it be that its choice is influenced by the atmosphere of a valley, or by the peculiar vegetation of such a locality, or by the presence of hills or the proximity of running water?

It is easy to assume that food is the deciding factor, but if we understand food in the scientific sense of nourishment, we might think that insects in general would suit the pied as they do the spotted flycatcher. Neither is it the available quantity of the food that limits the numbers or the range of these birds. An idea of the possibilities, both for the flycatchers and for ourselves, may be gathered from the fact that in the summer of 1928, sixteen pairs of pied flycatchers nested in one Breconshire garden and among them reared seventy-nine young.

Six different species of tit, all of which live on insects, manage to thrive side by side throughout a large part of the country. In winter it is not uncommon to find all six

of them in one flock employing the same methods of hunting, and preying on the same types of insect. In spring they do not fight each other over the food supply. I have never seen two species of tit fighting, but if they ever do, it must be for the possession of some desirable nesting hole.

Nevertheless the distribution of the tits is remarkable. Five of them are so common in the south-east of England that to observers living in that part of the country, it must be difficult to believe that they are not equally common everywhere. The great tit, the blue tit and the cole tit are plentiful in most districts, but they are scarce or rare in some of the northern counties of Scotland. The cole tit is the most common of the three in the north of Scotland. The great tit and the blue tit are common in Ireland, but the cole tit is replaced in that country by the Irish cole tit which is yellow instead of white on the back of the head, on the cheeks and on the breast. In certain districts of the south-east of England I have found the marsh tit at least as common as the cole tit, but it seems to be more plentiful in some parts of the country than in others. It is not found in Scotland or in Ireland. In south and central Scotland there is another species, the willow tit, which closely resembles the marsh tit. There are several slight differences in the plumage of the two, but the most important is the colour of the crown, which is glossy black in the marsh tit and dull black in the willow tit. So far the distribution of the two is convenient for observers. But the willow tit is also to be found in many parts of England. In some localities it may replace the marsh tit and in others may mix with it in the winter flocks. It is possible, therefore, that many of the birds that are identified as marsh tits are really willow tits. More careful observation will show whether this is so.

At first sight it would seem comparatively easy to understand the isolation of the crested tit. Formerly the crested tit was confined to the pine forests of the Spey valley in Scotland, but in recent years it has been found nesting in outlying districts and, as the planting of pine and fir woods extends, it may spread. Its nearest relatives live in the Alps and in Scandinavia. Being a bird of the pine woods it was probably at one time the commonest species of tit in the country, but as the conifers were destroyed and replaced by deciduous trees, its numbers were gradually reduced, and it was driven farther and farther north till at length the only territory in which it could exist was the belt of pine woods in the Spey valley. That is all quite simple to understand until we realise that it does not feed on any part of the pine tree but on insects. Other species of tit can find their insect food on pine trees, but they can do so equally well on any kind of tree. Why should the crested tit be so exclusive in its choice of feeding grounds? Even the crossbill, which is specially adapted for feeding on the seeds of coniferous trees, can obtain food on other trees or on the ground or among sea-wrack. Is it that the crested tit has become so obsessed by the flavour of insects bred on pine trees that it cannot accept any others as food? Or is it that the bird has evolved a special technique for dealing with the insects that lurk among the needles and in the bark crevices of the pine, and does not feel happy when faced by the usual problems presented by the insect inhabitants of other trees Or can it be that it likes the scent of the pine trees, or the general effect of its peculiar environment and is not happy in any other surroundings? The golden-crested wren also finds its living almost exclusively among coniferous trees, but it has spread all over the country and is so common that you may confidently look or listen for it wherever in garden or wood

a few pines, firs, yews or similar trees may be growing. There is no peculiarity in the nesting habits of the crested tit to account for its preference. Or are we to believe the old theory that this bird was driven into its Highland fastness and is now kept there by the fierce competition of its six enterprising cousins? If so, what does this competition mean? Those six cousins are so friendly with one another and with other birds during the lean period of the year that they cannot be said to compete at all, for during the period of plenty there are any number of unoccupied holes which are suitable nesting sites for tits.

It is easier to understand the isolation of the bearded tit, a beautiful and charming bird which is now confined almost exclusively to the Norfolk Broads. This species in summer lives and rears its young on insects, but in winter it depends on the seeds of the reed. So it is tied to an area in which there is a plentiful supply of this food.

Not so the reed warbler which occupies similar territory in summer, but spends the winter abroad. We are told to believe that this bird was forced into the reed beds by the fierce competition of its cousin the sedge warbler. It is difficult to accept this when you compare the isolated pairs of sedge warblers which nest in the vicinity of the reeds, with the number of reed warblers which are able to live comfortably and amicably among the reeds. My impression is that there is room for many more pairs of sedge warblers than are able to survive the dangers of migration and a winter residence in Africa, and that the reed warblers, from the time they arrive to the time they leave, are never overcrowded.

The wood warbler is almost exclusively attached to beech and oak woods. Why should this be? Is it due to the competition of its very near relatives the willow warbler

and the chiff-chaff, or is it simply a matter of taste? The willow warbler is very common, but between every pair of willow warblers there is room for at least one pair of wood warblers and one pair of chiff-chaffs. If competition is the explanation of their distribution, why are these birds not there now struggling for their rights?

A similar problem is presented by the grasshopper warbler and other species which are nowhere so super-abundant that we cannot hope for more of them. Any field observer who notes the distance between one pair of whitethroats and the next, must agree that the country would not be over-populated by whitethroats if another pair were to occupy part of the intervening space, and that the idea of one male whitethroat hearing the song of his neighbour and retreating to a safe distance at the sound of it is an absurdity.

But what must we think of the Dartford warbler? This is the only species of warbler that remains with us all the year round. It lives on gorse and heather-clad wastes, but though we have these in most parts of the country in generous measure, it is confined to a very few of them. It seems to flourish best, or, at any rate, it is most plentiful in Hampshire and after that, in Surrey, but even where it is most numerous it will occupy one common in a district and eschew the rest. In spite of its hardiness this bird is not increasing in numbers and spreading; it is actually losing ground. In some counties where formerly it nested, it is now extinct, but there are still isolated colonies as far apart as Cornwall, Salop and Suffolk. There is plenty of scope for its expansion in the area thus pegged out, but although its natural enemies have been wellnigh abolished, it is not taking even a reasonable advantage of its opportunities to multiply. Considering its sedentary habits we might

reasonably assume that in former times it reached those outlying stations by gradual advances. In that case the colonies that occupied the intervening stations have been destroyed either by natural forces or by man, and some influence is operating against the increase of the species at the present time. Can it be shown that either its conservative devotion to particular commons or its failure to hold its ancestral territories over the greater part of its range, is due to the competition of other species of warbler or of any other bird?

CHAPTER SEVENTEEN

BIRDS AND OURSELVES

THE habit of wintering in flocks is not universal among birds. There are many exceptions, and the most notable of them is our old friend robin redbreast. No matter how many families of redbreast were reared in your garden last summer, only one robin will be there now. All the others will have been driven out to seek their own fortunes, for the robin is a thorough individualist. When he migrates he travels in flocks like other birds, but when he settles down for the winter, his law is "every bird for himself." This explains the fighting which is so common among robins in September and October. It is not that the bird is quarrelsome, but simply that only by fighting can he prove his right to his property. When the war is over you will find that the whole country has been divided into little terri-

tories, each of which is occupied by a single robin who is prepared to defend it with his or her life. In my experience there is less fighting among robins in the open country than in the neighbourhood of human dwellings. This is just what might be expected; a territory that contains a house which provides an ample supply of food, especially in hard weather, is a possession worth winning and holding.

Here, we might say, is an authentic example of a bird which holds a territory for the sake of its food supply. But in fact there is no evidence that the robin holds his winter territory for any purpose whatsoever except as a space in which he may sing without interference. The fighting which has impressed most observers so exclusively is not only incidental and is comparable to the border clashes of clansmen; it is the only means by which a species which is incapable of building a wall, can establish a boundary. But it does demonstrate something else which may be as important as the creative achievement of the song, and that is that the robin has acquired an elementary sense of right and wrong. When he is in his private estate he sings, true artist that he is, with complete confidence and consequently his voice and his artistic inspiration are superb, and when he is called upon to defend his sanctuary he attacks with the courage of heroic righteousness. But when he makes a foray into a neighbour's land his song is half-hearted and hesitant because he knows that he ought not to be there, and he retires as soon as he is challenged, fighting doggedly perhaps but without hope of success and thus acknowledges the justice of the owner's wrath. It is only right and wrong in relation to property and though, through lack of writing, it may never rise to a higher level, it at least deserves recognition and respect. Even his mate is not allowed to enter it. She may occupy an adjoining

territory, but presumably she must hold that as he holds his, by fighting for it. Whether she ever does have to fight for her livelihood against her more robust husband and sons, is an interesting speculation, but at any rate, she is threatened with violence if she dare enter his territory and he if he venture into hers. In imitation of his methods she even sings a little, but whether she does so in emulation of his artistic powers, or in an attempt to persuade possible intruders that her feeble pipe is the war cry of a fierce and dauntless swashbuckler who is ready to kill at sight any robin, male or female, who is foolish enough to set foot on his land, is another matter for speculation. She might deceive with her voice unobservant human beings, but never members of her own species. My own belief is that she sings because she likes singing and finds it a pleasant way of killing the boredom of her long and lonely vigil. If she wishes to shout defiance at her neighbours, she can do so much more easily and effectively by means of her strident call note. The wren, the dunnock and other birds also sing in winter, and I have not yet found any evidence that they hold winter territory in the sense that the robin does. On the other hand, there is plenty of evidence in the lives of gregarious birds that each individual defends the little piece of territory that contains its nest.

The robin has owned mankind for many ages. Other species are in process of discovering him. The tits, which in ordinary circumstances live in flocks and flit through the woods from tree to tree in search of hidden insects, are learning more and more to exact from us tributes of suet and cocoanut ; the water-hen, which is one of the shyest of birds ten miles from St. Paul's, has invaded our city ponds where it picks up crumbs from among our feet; and the seagulls, which are as wild as the sea in their natural

environment, have formed a habit of migrating annually to the heart of our cities where they expect and receive tributes of bread and are even willing to take them from between our fingers.

Half a cocoanut hung up will provide several tits with food for a long time. Still better, a cocoanut with a hole in each end, or a hole in the bottom and another in one side large enough to admit a tit, will add greatly to the interest of their doings. The best arrangement of all is a little swing consisting of a perch about six inches to a foot in length, attached to a branch by a string at each end. To the perch should be hung by a thread half a dozen kernels of hazel or monkey nuts. These should be well out of reach of a bird sitting on the perch. Blue tits, cole tits and marsh tits may alight on the nuts themselves and eat while clinging there, but the great tits will prefer the perch and the others will alight there more often than not, and when they do they will give you an example of real bird intelligence. They will look down at the nuts, turning their heads first to one side and then to the other, and no doubt their mouths will be watering all the time at the sight of that wonderful string of nuts. But presently, having thought it all out, they will reach down, seize the thread in the bill, draw it up a little, hold it with one foot on the perch, then reach down and repeat the process till at last the nuts are on a level with the perch and can be eaten at ease.

I first saw this done by a great tit which drove off a blue tit that was clinging in its natural way to the threaded nuts, but I have since watched a pair of blue tits accomplish the feat repeatedly on a swing that was hung too near a window to overcome the shyness of the great tits visiting the garden. As the birds are constantly interrupted either by rivals or by the approach of enemies, they have to repeat the process many

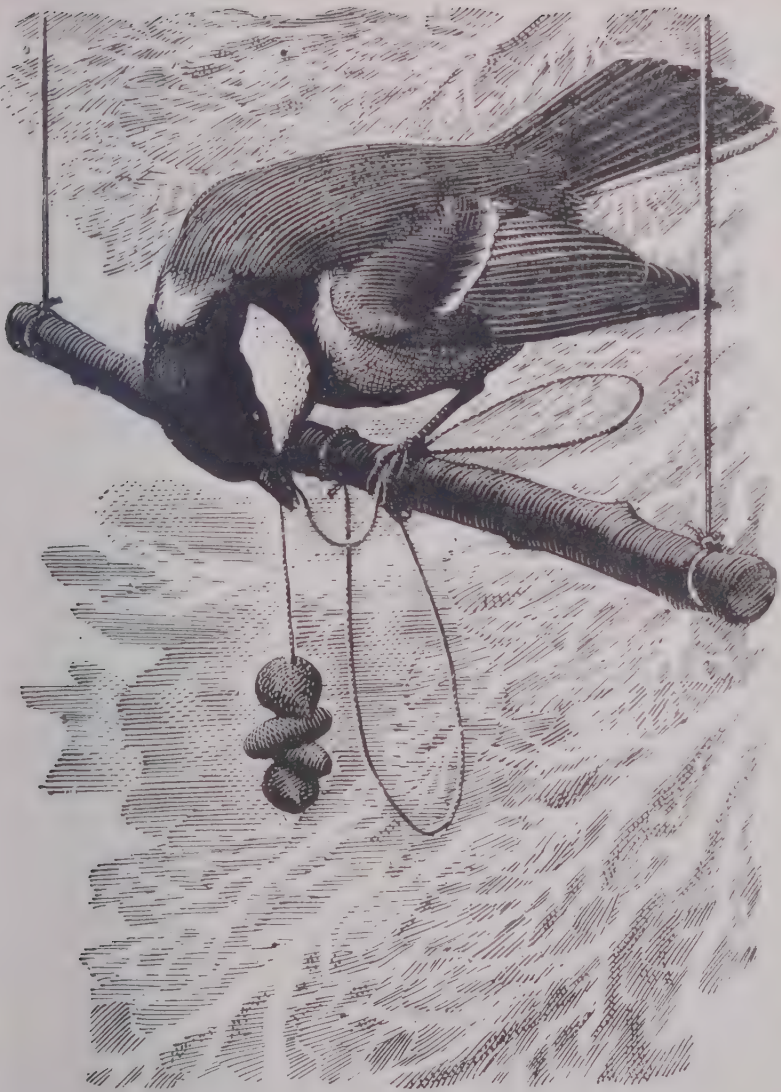
times every day, and this provides splendid opportunities for observers and excellent subjects for photographers.

Now, this is not a trick. The birds have not been taught to do it in a cage and then released. They are wild birds and there is nothing in their natural surroundings that would cause them to develop this power as an instinct. None of their forefathers ever saw a string of nuts dangling from a twig, but no sooner is this new problem presented to these active little mites than they solve it by using their brains.

When putting out food for the birds it is well to remember two things. One is that not every species of bird cares for bread crumbs, so if you make a practice of offering them as well little shreds of meat or suet, you will probably attract a larger number of species. Birds that live on insects and worms, such as the pied wagtail, the starling and the blackbird, would be tempted by such tit-bits. It is the sparrows that get most of the bread crumbs.

The other thing to remember is that birds are thirsty creatures. They spend most of their time feeding, but, like ourselves, they must have water, and sometimes they fly considerable distances to find it. All naturalists know that one of the best places at which to wait for birds is some favourite drinking pool. So a glass of water attached to the side of the bird table in such a way that it cannot be upset, and with its rim on a level with the surface of the table, will be welcomed by all your visitors, and will even be an attraction in itself.

A glass of water was placed close to a tit-swing for a double purpose; first, to provide a pair of blue tits with drinking water, and secondly, to attract them to a nesting box that was nailed up close by. The tits examined the the box, but when spring came they nested elsewhere, and it became the home of a colony of wasps.



Great Tit.

But all through the winter the tits used the water regularly both for drinking and for toilet purposes. The glass was too small for them to bathe in it, but they managed to spray the water over their backs by the usual method of plunging their heads into it and then shaking them violently. When they had soaked themselves in this fashion they repaired to the swing, and there for about an hour they would sit and preen themselves, smoothing out their ruffled feathers with as much care as a girl devotes to the brushing of her hair, and evidently with a great deal of satisfaction. I cannot say that they sat and admired their reflections in the window, which was only a couple of inches away, but they showed signs of being as well pleased with themselves as if they had done so.

The robin's boldness, or tameness or trustfulness, whichever it may be, is proverbial. So long as nothing is done to startle him, he will come through open doors and windows to pick up crumbs. But any owner of a garden who is content with that proof of his confidence is missing an opportunity. With a little encouragement a robin can be taught to fly to your call from any part of your garden and to sit on your hand and feed there. Mealworms will warm his heart towards you and may become a strong link in your friendship with him. In time he will recognize you as you enter the gate and welcome you with a greater show of affection than is offered you by many an enforced pet. It is mostly cupboard love, but what a difference there is between that and the fear which your very prescence inspires in the majority of wild creatures.

The confidence of other wild birds can be won in a similar way. The suspicion and wariness of the sparrow are almost proverbial as the trustfulness of the robin, but I have seen a shoeblack in a busy London street induce

a cock sparrow to sit on his footstool and accept bread crumbs from his lips. At one time the man who could call the birds in Hyde Park was a wonder, but now the sparrows there have become so used to human beings that with very little persuasion they will alight on anybody's hand to take offerings of food.

The sparrow has been familiar with man for so many generations that there is little to be wondered at in its ready acceptance of favours when our old enmity is changed to friendliness. To anyone who knows the wildness and wariness of the wood pigeon outside London, however, the behaviour of the wood pigeons which have taken possession of the London parks is a revelation. These birds have become almost as indifferent to human beings as the domestic pigeons in a poultry yard. I have seen one alight on the tables at the cafe to pick up crumbs, though people were sitting at neighbouring tables and others were passing to and fro close by.

Many of the water birds that we see in the lakes of our city parks are still pinioned, I am sorry to say, but every year more and more species are realizing that there is security in those waters and are voluntarily taking up their quarters on them.

The coming and going of the seagulls and the feeding of them with bread are now well-established features of London, and the most astonishing part of this wonderful phenomenon is the fact that the young birds are as confiding as their elders which may be presumed to have had at least one season's experience of human kindness.

Most of those gulls that spend the winter in London are black-headed gulls. They have adapted themselves completely to city life. When the tide is out they feed on the mud of the river bed, or pick up bits of waste that may

be floating in the water, but they depend more on the food that is thrown to them by people on the Embankment or the bridges and from the banks of the lakes in the parks. They have become so used to this that, even if none of them should be near, you have only to pretend to throw something and in a few moments dozens of them will be flying towards you from all quarters. They have learnt by experience that this movement of the arm is a sign, and that it is worth while to respond to it.

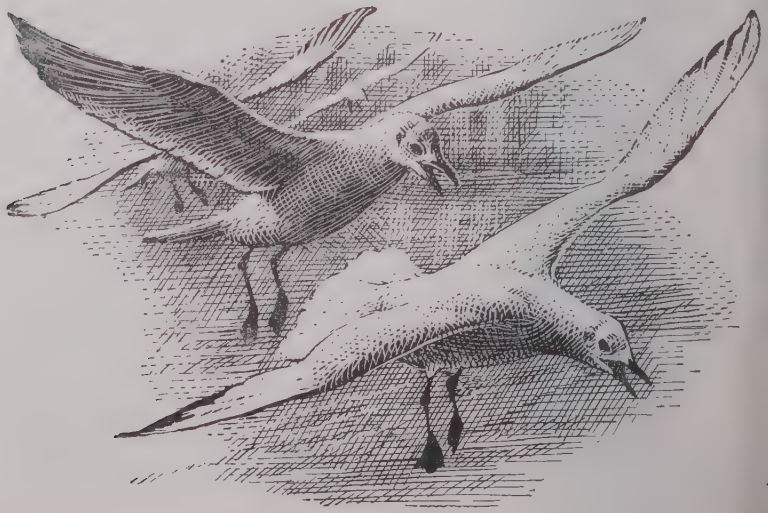
I had often seen these gulls being fed in this way and once I watched a woman trying in vain to induce them to take bread from her hand, and I thought I understood why she failed. So I decided to make an attempt myself, and one day in February, during severe winter weather, I armed myself with a pocketful of scraps and went down to a quiet part of the river where I knew there was little chance of being disturbed. Very soon there were hundreds of gulls wheeling about before me in a dazzling, excited flock. There was no fighting, squabbling, or jostling among them. They followed each other round and round, flying slowly, silently, very gracefully and with the greatest ease, each throwing its head towards me as it passed in readiness to catch anything I might cast before it. And if I did, it seized the morsel with a lightning snap of its bill and swept on, dodging its envious companions until it was able to swallow the mouthful. If I did not, some of them as they came just opposite me would pause in their flight and holding themselves almost upright, would keep expectantly in one position, with a few skilful flaps of the wings, neither rising nor falling, till they were crowded on by others. But if a piece of bread dropped between two of them, then there was a general, excited and shrieking scramble after it, and always it was caught before it could reach the water.

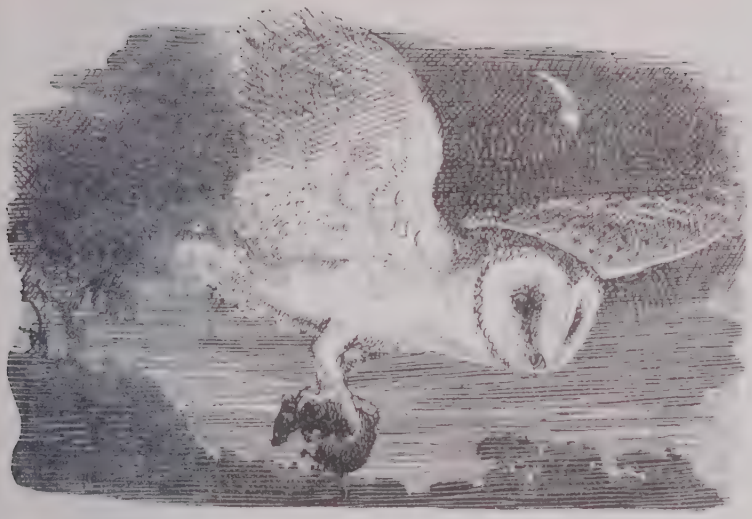
When this had been going on for a little, happily and successfully, I went a step further. I placed my open hand flat on the parapet and put a tempting lump of bread on the palm and waited to see what would happen. At once all the birds drew off suspiciously, so I threw the bread to them and brought them back. Having done this several times, I set some lumps on the parapet a little way from me. After some hesitation these were taken by the bolder birds. Then I spread a few nearer me. This time there was more doubt. Two or three of the gulls swept down quite close to the scraps but had not enough courage to snatch. But the food was very tempting, so tempting that one bird at last could not bear to pass it any more. Instead it alighted on the wall just beyond my reach, where it felt fairly safe and yet was able to keep its eye on those wonderful lumps. I pretended to look away but watched out of the corner of my eye, and presently, after once or twice taking a few timid steps forward and running back again, it suddenly made a wild rush in and, shrieking half in fear and half with delight at having done such a daring thing, dashed off with the lump in its bill. This was repeated again and again, some birds following suit and others seizing the bread as they flew past. Then again I tried a piece on my palm, placing my hand flat on the spot from which they had been taking the food so readily. They noticed the difference at once, of course, and did not like the look of that hand, but while some of them drew off as before, others were not quite so shy, and, after several had come very close and then lost courage, the boldest among them swooped swiftly and carried off the prize. That was enough. The lesson was learnt, and they knew they could trust me. The next three lumps were snapped up almost as soon as they were put on my hand, and the rest were

grabbed from between my fingers the moment I took them from my pocket.

It was a wonderful experience to have those hundreds of beautiful creatures floating about so close to my head, to watch their matchless movements, so simple, so restful and so full of grace, and to hear the soft *with-with* of their wings as they slowly and gently wheeled and threaded in an ever-changing, elegant dance before me. And I went home with my forefinger tingling from a chance blow of a seagull's bill, and a firm belief in my mind that if I had been able to go out to the same place and do the same things every day for a week, I should have made such good friends of those birds that I should have been able to train them to do almost anything.

This was many years ago. Now such education is hardly necessary, especially if you offer them scraps of bacon rind.





CHAPTER EIGHTEEN

THE PROTECTION OF BIRDS

According to the fashionable theory of biology there ought to be a superabundant bird population in the British Isles. That theory is that if the natural enemies of a species are eliminated or even reduced below their natural numbers, the species thus relieved will multiply inordinately and in a short time will outrun the limits of their food supply. It will then either be destroyed by famine or pestilence or both, only a few survivors remaining to carry on the race, or it will save itself by splitting into two or more sections, one of which will continue to live on the traditional food of the race and the others will find some new source of supply. Something seems to have gone wrong with this law, however, for the most important natural enemies of our birds have been almost exterminated

yet our bird population in summer is not nearly as large as it ought to be. For example, there is the starling. We have ascertained that our own native starlings do not migrate, and we know that enormous numbers of starlings come from northern, eastern and central Europe to winter here. So during the lean months of the year far more starlings are supported by the country than during the months of plenty. If our native starlings had multiplied as they ought to have done, according to the theory, in the absence of birds of prey, there should be no room for those millions of aliens, and either they ought to pass on farther south or they should force an equivalent number of the native starlings to migrate. In other words, there is room in the country for an immense increase of native starlings.

What is true of the starling is also true of other species. There is ample evidence that the country is capable of supporting many more pairs of all our birds, no evidence whatever that any species is restricted in numbers by the relative scarcity of its natural food supply. Enormous numbers of rooks, crows and jackdaws, fieldfares, redwings and other thrushes, chaffinches and other finches and buntings, skylarks, pipits, woodcock and other waders, goldcrests, robins and many more, come in to swell the numbers of our resident species during the winter and take toll of the available food for about six months of the year. Even those numbers are apparently not excessive, otherwise we should have distressing reports in at least some winters of one or more species dying wholesale of starvation. We never have such reports except during hard weather when frost and snow bind up food and water, and at such times the distress vanishes as soon as the thaw comes and releases the supplies.

All those winter visitors go off to the great empty

northlands just when the manifold forms of life on which they feed are beginning to multiply again, and leave our native representatives of their species to occupy the vacated territory and over-populate it if they can. But when the natives have tried and failed to do this, back come the foreigners in larger numbers than before and spend another winter with us. And so it goes on year by year.

Even those rare species which are restricted to small isolated areas owing to their peculiar habits, are not faced by starvation. There is room for many more pairs of bearded tits in the Norfolk and Suffolk Broads, for many more pairs of Norfolk plovers on the South Downs and other suitable districts within its present range, for many more pairs of Dartford warblers on the gorsy commons of England and for many more pairs of crested tits in the pine woods of Scotland. If they were all to double their number in one season they would not be in any danger of exhausting the available food, they would not even begin to approach the economic limits of their supplies.

The assumption, therefore, that food is the factor that governs the numbers of our British birds is not justified by the evidence. The country can support many more of them, and as birds are desirable associates for various reasons, it is important that we should know what other factor or factors are militating against them so that, if possible, we may remove their handicap and reap the benefit.

Changes in the character of a district inevitably affect its bird inhabitants. They may reduce or increase the numbers or may drive off some species and attract others. When the fens were drained, for instance, marsh and water birds which had occupied those areas for ages were deprived of the greater part of their nesting and feeding territories

and had to seek refuge elsewhere. When a new sand pit is dug, its sides offer convenient nesting sites for sand martins, and it may thus increase the numbers of that species in the district. When woods are destroyed the various birds that have lived in them are forced to find other quarters. Expansion of towns and cities by converting woodland and field into suburban houses and gardens, drives off the shyer bird and attracts the bolder; for example, it may substitute sparrows and starlings for warblers and skylarks. A large reservoir was recently drained and at once its population of swimming birds was replaced by waders, and when it was flooded again some months later the waders had to retire and the swimming birds returned.

Such changes are a necessary accompaniment of our own progress and development, and the ebb and flow which they cause in the bird life of the country cannot be avoided. It has been found, however, that wherever birds are protected from the individual human being they prosper and increase in numbers. The destruction of bird life that has been wrought by ignorant, thoughtless, selfish or callous people in spite of bird protection laws, is almost incredible. When we see Londoners feeding seagulls with their hard-earned bread, it is difficult to believe that so recently as 1868 it was considered an amusement to slaughter gulls and other sea birds while they were brooding their eggs or feeding their young. Those birds nest in colonies, some of which number hundreds or even thousands of pairs, so in the breeding season they offer easy prey to gunners. The temptation was so great that it paid the railway companies to run special excursions at that season from London and other large centres of population to the more accessible nesting grounds. Every year the excursionists destroyed

thousands of parent birds, and as the young ones were thus left to die of starvation, the number of our sea birds dwindled. The birds were not killed for food but for "sport," but enterprising dealers did a lively trade in the wings, which were bought by milliners for the decoration of women's hats. This shameful "sport" was stopped by Act of Parliament in 1868, and since then several Acts have been passed for the protection of birds, but the destruction of birds for the decoration of women's hats was not prohibited till many years later.

At one time women had a craze for wearing "grebe-fur," which consisted of the beautiful breast feathers of the great crested grebe. So popular did this form of decoration become that, in order to satisfy the fashion, the great crested grebe was ruthlessly destroyed wherever it was found, and before long this attractive and interesting bird became one of our rarest species. When the fashion waned the persecution relaxed, but it was not finally suppressed until the Plumage Act was passed. In consequence of the freedom it has gained by the indifference of milliners and their customers and the protection that has been extended to it by various statutes, the great crested grebe has multiplied and spread and is now one of our common birds.

In olden times birds of prey were protected by law because they were wanted by those people who indulged in the sport of falconry. Nowadays they are not protected, because they are not wanted by the people who preserve or rear game birds for the purpose of slaughtering them wholesale at organised shoots, when the close time for such birds ends. Whether this type of shooting can fairly be called sport must be left to others to decide, but at any rate bird lovers must recognise that the owners of the land

on which the pastime is enjoyed, are careful to leave a sufficient number of the birds to replenish the supply in spring and so provide a similar entertainment in the following autumn. On the other hand, the landowner gives his gamekeepers instructions to destroy all "vermin," that is all creatures, including birds, which prey or are presumed to prey on game birds or their chicks. The gamekeeper of course has a gun, and he would not be human if he did not use it on every possible occasion. In his zeal to do his duty, or to justify his wages, or to curry favour with his employer, he not only shoots the sparrowhawk which does take pheasant chicks, but any other bird which looks as if it might take them. He therefore destroys several species which are not only harmless to the breeder of pheasants but are actually beneficial to the country. He shoots the kestrel because it is a bird of prey; but the kestrel feeds chiefly on field mice and beetles, and though it sometimes takes small birds, it seldom touches pheasant chicks. He has so persecuted the buzzard, an equally interesting and harmless bird, that he has driven it from the greater part of the country, and it is now to be found nesting only in those wilder mountainous districts where it has some chance of living in peace. All other birds of prey he treats with similar ignorance.

Both gamekeepers and farmers destroy owls and both from ignorance of the birds' habits. The gamekeeper imagines that owls prey on pheasant chicks. The farmer shoots owls because it has been the custom to kill them for ages. The custom probably originated in superstition. The eldrich screech of the barn owl is always startling, and to nervous or ignorant people, hearing it at night without seeing the cause of it, it may be terrifying. We can easily understand, therefore, that it would arouse

superstitious fear in the minds of ignorant rustics. But now farmers are educated men and are capable of learning the habits of owls from books if they have not the inclination to do so by observation. When we consider what a valuable servant the barn owl is to the farmer we cannot help wondering why the farmer, instead of killing him, does not protect him as a sacred bird and even build barns specially for him to roost and nest in.

For one meal a single barn owl will eat eight or ten mice or a full-grown rat. An owl probably has two such meals every night, one in the evening when he wakes up, and the other about daybreak before he retires to his hiding-place for the day. So a pair of owls will devour between them from four to eight rats (according as they are young or full-grown) or about forty mice every twenty-four hours. But when they have a nest of hungry youngsters to feed, these numbers increase enormously. Besides those they eat themselves, they bring a mouse or a rat to the nest every ten minutes, so for several weeks in the breeding season they must destroy over a hundred rats and mice every night. And yet the men for whom they perform this important service kill these wonderful birds, and allow the rats and mice to devour millions of pounds worth of their produce every year.

The other species also feed chiefly on mice, rats and insects. Occasionally they take a small bird, and there are isolated instances of owls carrying off pheasant chicks. But owls are normally night feeders and, before they come forth to hunt, all well-bred young pheasants are in bed. Even the day-flying little owl does less damage to game than landowners and gamekeepers would have us believe. But even if owls do sometimes take young game, surely a few superfluous pheasants are a small price to pay for the

great benefits which owls as a race confer on all who are concerned with agriculture.

The destruction of birds of prey by game preservers is deplored by naturalists, but bird lovers as a whole find compensation in the number of smaller species which are thus relieved of the attentions of some of their most dangerous enemies. The price we should have to pay for an increase of hawks and falcons would be a reduction in the numbers of our singing birds, and as these are very largely destroyers of injurious insects, the change to a normal balance of nature would be disadvantageous to ourselves.

This aspect of bird life is generally overlooked. Whenever a bird is suspected of doing us an injury, we condemn it without trial and without troubling to enquire whether it does any counterbalancing good. In spring, for instance, a gardener or a fruit grower sees the tits on his fruit trees and may actually observe them tearing out some of the buds. That is proof positive of a crime, and he therefore shoots them and feels that he has done a good day's work. But if he only knew it, he himself is the debtor. Many tits killed in all parts of the country and at all seasons have been examined by a well-known biologist and he has found that fruit buds represent only a very small percentage of their food. The amount taken by the great tit, which is generally regarded as the chief sinner, is 1.5 per cent but 66 per cent of this bird's food consists of injurious insects. The proportion is slightly higher in the case of the blue tit, namely 2 per cent, but insects are its staple diet and injurious insects form 78 per cent of its total consumption of food. Surely 2 per cent of fruit buds is a small price to pay for such services.

Many people have told me that the blue tit eats their

green peas, and peas are given in the *Handbook of British Birds* as part of its diet. But scientific examination of blue tits "shot in the act "of eating green peas, has proved that their crops contained nothing but insects. Indeed blue tits are attracted to peas not by the contents of the pods, but by a certain species of greenfly which flourishes on the leaves. That peas are destroyed by some wild creatures is unquestionable, but the culprit is most probably the long-tailed field mouse which works after dark.

For generations the magpie and the jay have been persecuted by gamekeepers on the ground that they destroy the eggs and chicks of game. At one time flocks of magpies were not an uncommon sight in some parts of the country, but owing to the attentions of the gamekeeper, the species had, before the Great War, become comparatively scarce. Many specimens of both magpie and jay have recently been examined scientifically with the result that the magpie has been proved to be definitely beneficial and the jay neutral or, in other words, on the whole not injurious.

Indeed, the vast majority of our birds are either beneficial or harmless, and there is something to be said in favour of the very few whose records are black. When the corn is ripe, for example, the common sparrow repairs to the fields in flocks and destroys a large quantity of grain. So for a few weeks every year it becomes a pest. But it cannot do any harm during the winter, and in spring and summer each pair rears several broods of young ones and feeds them exclusively on insects, and while they are doing so they live themselves on the same diet. The rook and the starling have been convicted of taking sown grain in winter and spring. Both birds, however, go to the fields to feed on wire-worms, leather jackets and other injurious grubs that live in the ground, and the good they do by

destroying these pests far outweighs any damage they may cause incidentally. If the farmer had to pay for the destruction of the grubs, the cost would be greater than the value of the grain he loses and the work be very badly done. A farmer recently wrote to the newspapers that when he bought his farm he could grow no corn because, owing to the persecution of the rooks by his predecessor, the fields had become infested with wire-worms. He had at once reversed this policy by encouraging the rook and had induced it to establish a rookery on his land, with the result that the pest had been controlled and the fields were now yielding good crops. The bullfinch is a criminal in fruit-growing districts. He eats the blossom buds, and so long as he does that he will incur the enmity of the fruit farmer. In other districts he is comparatively harmless. I know a fruit farmer who, when he saw five cock bullfinches on one of his own pear trees, rejoiced in the beautiful sight and was annoyed when the barking of a dog drove them away. This man has declared to me many times that he would never kill birds though they did a great deal of damage in his orchard every year; they were welcome to all they took because of the pleasure they gave him. We all know that the blackbird eats our strawberries, but who will say that he does not pay handsomely for all he takes.

No charge, however, can be brought against the lapwing. This bird is one of the farmer's best friends. It nests in the fields and feeds on grubs and other lowly creatures, most of which are injurious to the crops. Nevertheless the number of lapwings that nest in this country is decreasing. This is not because the bird's natural food is becoming less abundant than it used to be; the grubs are as plentiful as ever. It is because the farmer is foolishly robbing his best friend, or allowing it to be robbed, for

the benefit of city gourmets who pay absurd prices for the pleasure of eating plover's eggs.

Lapwings have a preference for ploughed fields; they both feed and nest there. That is just where they are of the greatest service to the farmer. My experience of farmers is that they welcome the lapwing as other people welcome the cuckoo; they like to see it in the fields and to hear it calling, but they have not the remotest idea of the good it does to the land. If questioned about it, the best they can say for it is that it is harmless. The bird, however, begins to lay towards the end of March, and it is probable that its first eggs, if undisturbed, are destroyed when the field is harrowed. The taking of these first eggs in the past, therefore, can have done little or no harm, for they were then eaten by the farmer's own family and their immediate friends. The taste for plover's eggs spread, however, and dealers finding a market for them offered tempting prices, so farmers took, or permitted others to take, every egg they could find and consequently the lapwing flocks dwindled. This became such a serious matter that the farmers had to be protected from their own folly by a law that prohibits the sale of lapwing's eggs.

This is one of the most recent of the laws for protecting birds. Another has put the bird catcher out of business by prohibiting the sale of wild birds as cage birds. There will be others, for birds have to be protected not only from farmers on whom they confer such inestimable benefits and from the customers of the bird catchers, but also from fashionable people who have developed an un-English craze for eating skylarks; from the shipping companies who befoul the sea with waste oil and so bring a miserable lingering death to thousands of swimming birds: and most of all from egg and skin collectors. Several laws

already exist for this purpose, but they are so full of confusion and so difficult to enforce that their provisions are to a large extent useless. There is only one way to protect birds satisfactorily by law and that is to protect them all without exception, and to grant licenses under rigid restrictions to those who wish to shoot or protect game, to farmers or others who wish to control species against which they can prove that they have a real grievance, and to those few unfortunates in remote parts who are forced by circumstances to live on wild birds and their eggs.

But no law will protect birds from the people who collect their eggs and skins, and there are thousands who do so. The egg collectors actually print and publish a journal, and in this one of the best known among them has said, "Oologists can be counted on the fingers of one hand; collectors are countless." That is a confession that whereas not more than five of them, by making their collections, are doing work that may or may not be of some value, all the countless thousands of others are year by year wasting countless thousands of eggs, or in other words are thoughtlessly or callously destroying countless thousands of useful or interesting bird lives.

It is pathetic to think of those thousands of boys and men wasting their enthusiasm on a form of natural history that went out of date many years ago. In the days of our great-grandfathers, collecting eggs and skins was a scientific necessity. We had to acquire knowledge of the eggs as well as of the birds that laid them. The work was done by a few real naturalists who were generally looked upon as cranks, but who did their work so thoroughly that they have left nothing for their successors to do except perhaps to solve the problem of colour. and that can be done without

adding to the vast quantity of empty eggshells already collected.

Naturally the amateurs whose interest in natural history was aroused by Darwin and his followers, copied the methods of the pioneers and became collectors. So much was this so that the egg collectors knew little about birds except at nesting time. This was reflected by the books that were written for their use. Even Richard Kearton's first book was only a guide for egg collectors illustrated by photographs. But in preparing that book Kearton discovered that there was far more in bird life, even at the nest, than the egg collectors had ever dreamt of, and when he published his next book, *With Nature and a Camera*, egg collecting went out of date.

There is no hope of reforming the old, confirmed egg collectors. They were born after their time and are therefore more to be pitied than blamed. But to boys and beginners of all ages I will say this. It is feeble to play at being Galileo when the world is full of problems that any one of us may help to solve. Natural History has advanced like all other sciences, and that branch of it which deals with birds has no use for further supplies of empty eggshells, but is clamouring for records of the living bird. The old-fashioned naturalist prided himself on possessing more worthless mementoes of nests which he had ruined than any of his rivals, and he took a particular pleasure in destroying the eggs of rare species. The modern bird lover finds infinitely more satisfaction in encouraging all birds and especially rare birds. His aim is to acquire knowledge of their habits, both hereditary and individual, and he can do this best when he can observe them frequently. He knows that if he takes their eggs and so prevents them from rearing young, they will become scarcer next year

and may desert his neighbourhood altogether, but that if they rear their broods successfuly, they will return year after year to the same nesting areas and their number will increase, if the many other handicaps against which they have to fight are not too strong for them. It has been argued that because Nature herself is so appallingly wasteful of bird life, the little extra waste caused by the collectors can do no harm. But this is just one more instance of the straw that breaks the camel's back. It is because Nature herself loads her servants so heavily that we cannot afford to let selfish collectors add the one more handicap to our British birds that will render life in this country impossible for them.

To protect them from these human enemies many areas have, within the past quarter of a century, been set apart as sanctuaries in which birds may live and nest in peace. But so persistent are the collectors, and still worse the dealers who make money out of supplying collectors with what they want, that these sanctuaries would be useless unless they were guarded constantly by paid watchers. This is most unfortunate. Such measures ought to be unnecessary. The very existence of special sanctuaries suggests that beyond those areas birds are outlawed. The whole country ought to be a sanctuary for birds, and they ought to be protected not by paid watchers but by public opinion. That will become possible when we have a national or royal natural history society with headquarters in London and a competent secretary in every village, district and county. Such a society would protect birds by its influence on the general public, but that would not be its sole nor by any means its chief purpose. Leaving the study of caged foreign creatures to the Zoological Society and the care of dead specimens to the museums, it would concentrate on

the natural history of the British Isles, collecting, winnowing and recording and publishing facts, and because its interest would be entirely with living creatures in a state of nature, it would protect and encourage them with or without the aid of laws or of sanctuaries.

It has been urged that there is danger in the over-protection of birds. That must be admitted. As I have already said, it is not the available quantity of its so-called natural food that limits the numbers of a species. Rooks and starlings are multiplying and will continue to multiply because they have found a new source of supply; they have taken to eating wheat in addition to their ordinary insect food. There is danger in that, but for the present the damage they do is probably paid for many times over by the good. Protection has enabled the great skua to increase in the Orkneys and Shetlands, but not the whimbrel. It has been stated that the skua has been over-protected and so has driven out the whimbrel, but it is equally probable that collectors, knowing how scarce the whimbrel was, have been competing with each other for the possession of "the last clutch of whimbrel's eggs laid in the British Isles," for that unfortunately is the measure of their interest in the matter. The society I have suggested would deal with such problems scientifically and would use its influence to readjust the balance wherever that should be proved to be necessary. Meanwhile the need for protection is so urgent that those who have voluntarily undertaken this splendid work—the Royal Society for the Protection of Birds and other bodies, groups and individuals –have to devote their whole energy to the more obvious human menace in all its varied forms.

Against such enemies laws and sanctuaries are powerless to save the many strangers that visit the British Isles

regularly, frequently or occasionally and might settle down and nest if they were encouraged. Protection has shown that species which formerly nested in this country but were driven out by the ravages of collectors, can be induced to return by being given sanctuary. The bittern has re-established itself in the Norfolk Broads and would do likewise in other suitable places but for the unfortunate attentions of ignorant gunners. The golden oriole appears in England every year and the hoopoe frequently and both have tried to nest. Both are beautiful and conspicuous birds and would be very welcome new features in our countryside, but their beauty is their undoing; they are shot whenever they show themselves. Some two hundred other species arrive here occasionally or casually. Only by chance will they find their way to the bird sanctuaries, and unless they do they will always be destroyed, until a gunner can no longer win praise or cash by shooting a bird because it is rare, or a collector by taking its eggs.

The bird life of our islands is a priceless possession. We can enrich it if we will by preserving and fostering those kinds that are established residents or regular visitors and by extending a hospitable welcome to all feathered wayfarers that reach our shores. This should be our pride and our boast, for the old era that worshipped stuffed skins in glass cases and cabinets full of empty eggshells is passing away, and in the new era which has already begun, we are lovers of living, free-winged birds.

THE END

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